

# THE ECHINODERM NEWSLETTER

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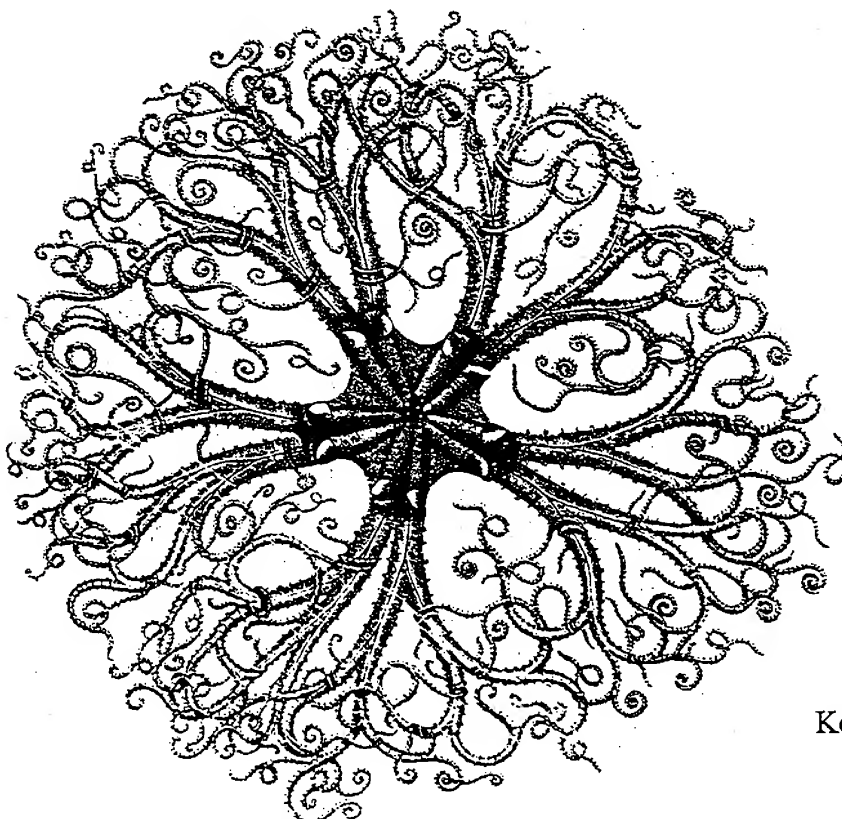
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The newsletter contains information concerning meetings and conferences, publications of interest to echinoderm biologists, titles of theses on echinoderms, and research interests, and addresses of echinoderm biologists. Individuals who desire to receive the newsletter should send their name, address and research interests to the editor.

The newsletter is not intended to be a part of the scientific literature and should not be cited, abstracted, or reprinted as a published document.



Koehler, 1899

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## ☆☆☆☆☆ CURRENT RESEARCH ☆☆☆☆☆

ADAMS, NIKKI L. - effects of and defenses against ultraviolet (UV) radiation on reproduction and development of marine invertebrates; currently examining whether UV affects gametogenesis or accumulation of cellular defenses against UV radiation such as mycosporine-like amino acids and small molecule antioxidants in the gonads and gametes of the green sea urchin *Strongylocentrotus droebachiensis*; investigating how these defenses might protect embryos and larvae of echinoderms against UV radiation.

AGATSUMA, YUKIO - herbivorous-algae interaction; ecological studies on population dynamics of the sea urchin *Hemicentrotus pulcherrimus*.

ALBI, YVONNE Z. - a Paleocene echinoid from the Santa Monica Mountains, Los Angeles County, California. A newly noted schizasterid.

ALI, MOHAMED SAID M. - study of some Jurassic and Cretaceous echinoids of Sinai, Egypt.

ALLEN, JOHN A. - deep-sea benthos of the Atlantic.

ALLISON, WILLIAM R.- I am a coral reef ecologist, and so am generally interested in Echinoderms. I have however, a particular interest in all facets of the life and times of *Culcita* spp. I am looking into the taxonomy and ecology of the species in Maldives, with special interest in its feeding ecology; completing research on reef survey methods and the status of Maldivian reefs.

ALVA, VICTOR - trophic ecology of benthonic suspension organisms.

ANDACHT, TRACY M. - studying the mechanism of dorsoventral polarity disruption and inhibition of fertilization envelope elevation by nickel chloride in the sea urchin embryo, *Lytechinus variegatus*.

ANDERSEN, AASMUND - study of chemically induced predator responses on *Strongylocentrotus droebachiensis*.

ANDERSON, OWEN - commercial fisheries research and marine ecology; population biology of commercial species of sea urchins in New Zealand, and the collection and identification of shallow water and deep-sea echinoderms.

ANDERSON, ROLAND C. - an escape action of the asteroid *Poraniopsis inflata* in response to other sea stars.

ARAKAKI, YUJI -Taxonomy of the sea urchin, *Echinometra mathaei* and *E. oblonga*.

ARCHER, JEFFREY E. - head curator at Blue Zoo Beijing Aquarium in China in all aspects of curation (including shark husbandry and invertebrate culture). I am also presently working in the development of sea cucumber culture in New Zealand.

ARONSON, RICHARD B. - patterns of predation on echinoderms in time and space from the tropics to Antarctica.

ASHA, PAYIKAT - breeding, seed production and sea-ranching of sea cucumber *Holothuria scabra*.

AUSICH, WILLIAM I. - early radiation and phylogeny of crinoids; crinoid classification; crinoid taphonomy; Lower Mississippian crinoid macroevolution.

- BALSER, ELIZABETH J. - mechanisms of asexual reproduction in echinoderm larvae.
- BANGI, HELEN GRACE P. - culture and management of the sea urchin *Tripneustes gratilla*; pilot testing of sea urchin grow-out culture in Bolinao, Pangasinan, Philippines.
- BARBOSA LEDESMA, ISRAEL FABRICIO - taxonomic study of Mexican sea urchin, particularly Family Cidaridae, species of *Hesperocidaris*.
- BARTSCH, ILSE - epi- and endozoa of ophiuroids.
- BASCH, LARRY V. - environmental effects on sea urchin (*Strongylocentrotus*) reproduction and development; influences of larval abundance and condition on settlement and recruitment of sea urchins; echinoderm larval nutrition; polar echinoid growth and secondary production; kelp forest ecology.
- BAUER, JOHN C. - Echinoid diseases and bacterial isolations from Bahamian bathyal sea urchins.
- BAUMILLER, TOMASZ K. - ecology and functional morphology of recent isocrinids; taphonomy of arms and stalks of articulates and advanced cladids vs. other Paleozoic taxa; diversity of Permian and Triassic crinoids and effects of the P/T extinction; patterns of turnover and extinction of Paleozoic crinoids; ecology of Seirocrinus; borings in Paleozoic pelmatozoans.
- BAZHIN, ALEXANDER - monitoring the condition of sea urchin populations (*Strongylocentrotus droebachiensis*, *S. polyacanthus*) along the Kamchatka peninsula shore.
- BEAVER, HAROLD H. - structure and function of blastoid summit plates.
- BECKER, JOHANN - marine invertebrates of Brazilian oceanic islands, including especially echinoderms.
- BEGBIE, KIRSTEN M. - studies on the hyponeural nervous system of the brittlestar, *Ophiura ophiura*.
- BELL, BRUCE M. - Edrioasteroids.
- BENAVIDES, MILENA - epifauna of the continental shelf of the Caribbean coast of Colombia (300 to 500 m). (thesis in progress).
- BENEJAM DE, CARLA - occurrence of brooding *Amphiodia* sp. in Monterey Bay (California).
- BENTLEY, ANDREW C. - biology of the sand dollar, *Echinodiscus bisperforatus* along the southeastern coast of South Africa, encompassing growth, reproduction, genetics, larval biology etc.
- BERENTS, PENELOPE B. - collection manager of marine invertebrates at the Australian Museum.
- BERGEN, MARY - The Southern Bight Pilot Project - a survey of soft bottom benthic communities between 10 & 200 m between Point Conception, California and the Mexican border.
- BERTRAM, DOUGLAS F. - evolution and ecology of modes of development in echinoids.
- BIERMANN, CHRISTIANE H. - Population genetic structure in the circumantarctic sea urchin genus *Stereochinus*; Reproductive isolation and population genetics in the Strongylocentrotidae (Echinoida); Camarodont phylogeny.
- BILLETT, DAVID S.M. - environmental impact on the deep sea; taxonomy of the genus *Mesothuria*

(Holothurioidea).

BIRENHEIDE, RUDIGER - morphology, physiology and biomechanics of crinoids.

BIRKELAND, CHARLES E. - coral reef management.

BIRYUKOVA, INGA V. - chemoreception; chemosensory systems and its morphogenesis in the marine invertebrates.

BLAKE, DANIEL B. - Cretaceous asteroids of Texas; Ordovician stelleroids; stelleroids of Seymour Island.

BLUHM, BODIL A. - age determination.

BLUHM, HARTMUT - Holothuroidea as possible indicators for physical disturbance impacts in the deep sea.

BOCKELIE, JOHAN F. - Rhombiferan cystoids, Scandanavia.

BONASORO, FRANCESCO - regeneration of crinoids.

BORRERO, GIOMAR - Taxonomy and distribution of echinoderms from 300-500 meters between Punta Gloria and Cape Tiburón (Caribbean Colombia).

BORZONE, CARLOS A. - Matinhos sandy beach replenishment and its impact on the benthic macrofaunal nearshore community; echinoderms of Parana's coastal waters, Brazil.

BOSCH, ISIDRO M. - UV effects on embryonic development of Antarctic and tropical echinoderms; Spawning periodicity of zebra mussels in New York's Finger Lakes.

BOUDOURESQUE, CHARLES F. - effect of the invasive introduced alga *Caulerpa taxifolia* on *Paracentrotus lividus*: population dynamics and diet; long term changes of *Paracentrotus lividus* (sea urchin) populations in a protected area and a non-protected area.

BOURGOIN, ALLAIN - studying the possibility of commercializing the green sea urchin *Strongylocentrotus drobachiensis* on the northeastern coast of New Brunswick.

BREGMAN, YURIY E. - Size-age structure and body growth studies of commercial sea urchins *Strongylocentrotus intermedius* and *S. nudus* at Japan Sea and Kuril Islands Coasts.

BRETON, GERARD - Tethysian Saccocomid Cretaceous crinoids; Asteroid phylogeny - Mesozoic - Europe, Africa.

BREY, THOMAS - Antarctic Echinoids: Diet, Growth. Antarctic Ophiuroids: Growth. Antarctic Asteroids: Diet, Population Dynamics.

BROGGER, MARTIN I. - biodiversity of the South Atlantic Ocean invertebrates in the Buenos Aires province area; trophic ecology of primitive asteroids (*Astropecten* spps. and *Luidia* spps.)

BROWER, JAMES C. - taxonomy, functional morphology, paleoecology, ontogeny and phylogeny of Ordovician crinoids and blastozoans from North America.

BUITRON-SANCHEZ, BLANCA E. - Cenozoic echinoderms (Stelleroidea and echinoidea) from Baja California, Mexico.

BURCH, BEATRICE L. - working on forams in gut of *Chaetodiadema pallidum* and in the surrounding sediments.

BURNS, CASEY - three possible new species of echinoids from the Eocene of Oregon at the Burke Museum in Seattle.

BUSSARAWIT, SOMCHAI - taxonomic study of echinoderms from the Andaman Sea, west coast of Thailand.

BYRNE, MARIA - life history evolution, echinoderm reproduction and development, ophiuroid functional morphology, echinoderm fisheries.

CALTAGIRONE, ANGELA - sea urchin aquaculture.

CAMERON, R. ANDREW - A promoter trap strategy for finding embryonic gene regulatory regions in the sea urchin genome; The spatial expression of known patterning genes in sea urchin larval development; A microsatellite analysis of homozygosity in an inbred line of sea urchins.

CAMPBELL, ALAN - sea urchin population dynamics ecology and fisheries.

CAMPBELL, ANDREW C. - zoogeography of Indian Ocean echinoderms.

CAMPBELL, DAVID B. - feeding behavior of *Asterias*.

CAMPOS-CREASEY, LUCIA S. - taxonomy of holothurians from the northeast coast of Brazil.

CANDIA-CARNEVAL, M. DANIELA - crinoid arm regeneration; structure, physiology and biomechanics of complex musculo-skeletal systems (echinoid lantern, ophiuroid masticatory apparatus).

CHAO, SHYH-MIN - population dynamics of the shallow-water holothurians of Taiwan; systematics of the echinoderms from Taiwan.

CHEN, CHANG-PO - ontogenesis of skeletal plate patterns, gonad, and gonapores in the progenesive *Sinaechinocyamus mai*.

CHIA, FU-SHIANG - retired - writing articles on environmental issues, particularly on marine environment.

CHICCA, ANGIE - volunteer collector for Birch Aquarium at Scripps Institution of Oceanography.

CLARK, ROGER N. - seastars of the Aleutian Islands, Alaska (North Pacific) of the families Pterasteridae, Solasteridae, Myxasteridae, Goniasteridae.

CLEMENTS, LEE ANN J. - effects of flow rate on skeletal regeneration in the burrowing brittlestar *Ophiophragmus filigraneus*; gene expression during arm regeneration in two infaunal brittlestars: *Microphiopholis gracillima* and *Ophiophragmus filigraneus*; larval toxicology - the effects of sublethal Zn exposure on larvae of the sea urchin *Lytechinus variegatus*.

CLOUSE, RONALD M. - taxonomy and behavior of *Bohadschia marmorata* and *B. bivittata* (Holothuroidea) from Micronesia.

COLON-JONES, D. ELIZABETH - rearing *Diadema* larvae; rearing coral larvae; studying the sediment regime on Biscayne National Park reefs; examining calcification rates of corals.



CONAND, CHANTAL - Beche-de-Mer Bulletin 10 (No. 9 - 1997); holothurian fisheries (Indian Ocean, Madagascar); asexual reproduction in sea cucumbers; population biology of the sea urchin *Colobocentrotus atratus*; biodiversity of reef echinoderms (La Reunion).

COSTELLO, MARK J. - developing a European Register of Marine Species (details at web site [erms.biol.soton.ac.uk](http://erms.biol.soton.ac.uk)).

CREASER, EDWIN P. - green sea urchin CPUE and management Maine.

CRUMP, ROBIN G. - asteroid development and ecology.

CUNHA DE JESUS, DORA MARIA - Seaweed harvest impact in echinoderm populations of SW coast of Portugal.

DAFNI, JACOB - echinoid growth.

DALBY, JR., JAMES E. - Growth of arctic ophiuroids in relation to ice cover.

DY, DANILO T. - I am presently working (my dissertation actually) on the "Nutrient interaction between macro-invertebrates and cultured seaweeds" with emphasis on echinoderm species commonly found in Philippine coral reefs. I tried to quantify the ammonium and phosphate excretions of the sea star, *Protoreaster nodosus*, the sea urchin, *Tripneustes gratilla* and the brittle star, *Ophioarachna incrassata*. I also plan to conduct a study on the effects of sea urchin density on the growth and photosynthesis of a cultured seaweed, *Kappaphycus alvarezii* and possibly quantify the role of echinoderms (specifically, sea urchins) in supplementing nutrients to the cultured seaweeds in coral reef platforms.

DAVOULT, DOMINIQUE - Ecology and functioning (carbon and nitrogen fluxes at the water-sediment interface) in coastal benthic communities with special reference to a dominant species, the ophiuroid *Ophiothrix fragilis* (Abildgaard); interactions between physics (hydrodynamism) and biology (suspension-feeding behaviour) for metabolism and recruitment.

DAYTON, PAUL K. - benthic ecology.

DE RIDDER, CHANTAL J.M. - symbioses in echinoids; food and feeding mechanisms in echinoids; taxonomy and biogeography of Antarctic echinoids.

DE WIT, WALTER M.J. - fossil echinoderms in fluvial and ice-age deposits of Holland.

DEAN, JULIETTE - Ordovician divergence of asteroids and ophiuroids.

DEARBORN, JOHN H. - identification manual for NW Atlantic ophiuroids; Gulf of Maine ophiuroid ecology; crinoids and ophiuroids of the Antarctic; functional morphology of ophiuroid podia.

DEBENHAM, PATTY - population genetics of the red sea urchin *Strongylocentrotus franciscanus*.

DETWILER, PAUL - population dynamics of echinoids, phenotypic plasticity and life history variation among ecotypes, echinoid/coral interactions, microbial flora associated with echinoids.

DEVIN, MICHAEL G. - Developing commercial sea urchin culture techniques (Aquaculture).

DEWAELE, YANNICK - control mechanisms of bioluminescence in the ophiuroid *Ophiopsila aranea* (Forbes, 1843): morpho-physiological studies. PhD thesis (in progress, started in Oct 1998).

- DIEHL, WALTER J. - effects of environmental stress on multilocus heterozygosity-growth relationships in invertebrates.
- DOBSON, WILLIAM E. - population biology of *Ophiura sarsi* on continental slope off North Carolina; use of skeletal growth bands in ophiuroid ossicles as biological markers for sublethal predation and population ecology experiments.
- DOLMATOV, IGOR Y. - Regeneration mechanisms and their changes during individual development of echinoderms.
- DOMINGUEZ, PATRICIO - working on early echinoderms, especially Cambrian and Ordovician Pelmatozoans and Carpoids from Spain.
- DONOVAN, STEPHEN K. - Caribbean fossil echinoderms, including Pleistocene echinoids of Tobago and Barbados; *Encope* in the late Cenozoic of Jamaica; Miocene crinoids of Carriacou; Predatory decapitation of crinoids; British Ordovician crinoids.
- DORNBOS, STEPHEN Q. - paleoecology of helicoplacoids and other Cambrian suspension-feeding echinoderms (for Masters Thesis).
- DRUMM, DARRIN - researching traditional holothurian fishery in the Cook Islands.
- DRUMMOND, ANNE E. - intra and interspecific agnostic behaviour in echinoids; wave action and consequences for *Echinometra mathaei*, *Stomopneustes variolaris*, *Diadema savignyi*.
- DUPONT, SAMUEL - luminescence in *Amphipholis squamata* (Echinodermata: Ophiuroidea): a suitable model for studying microevolution (for PhD thesis).
- EBERT, THOMAS A. - 1) Finishing work on growth and mortality of red and purple sea urchins (*Strongylocentrotus franciscanus* and *S. purpuratus*) along the west coast of North America. 2) The life-history consequences of the evolutionary timing of different modes of reproduction in ophiuroids.
- EBLE, GUNTHER J. - evolutionary dynamics in disasteroids, holasteroids and spatangoids; post-metamorphic spatangoid development; phylogeny of disasteroids, early holasteroids and early spatangoids.
- EEKELERS, DIRK - biodiversity and distribution of asteroids on the coral reefs of Kenya.
- ELISEIKINA, MARINA G. - Functions of echinoderms lectins; physiological and reparative regeneration of echinoderm internal organs.
- ELLERS, OLAF W. - growth of sand dollar teeth; catch collagen.
- EMLET, RICHARD B. - functional morphology of echinoderm larval evolution of echinoid life histories and development.
- ETNIER, SHELLEY - comatulid crinoids.
- ETTENSohn, FRANK R. - Systematics, paleoecology and functional morphology of the pelagic crinoid *Saccocoma*; Paleoecology of a Late Ordovician crinoid garden community; Paleoecology of a Late Ordovician edrioasteroid firmground.

- EVDOKIMOV, VLADIMIR - Influence of ecological conditions on sea urchins ontogenesis in coastal communities.
- FARMANFARMAIAN, A. VERDI - growth hormone and nitrogen retention.
- FAY, ROBERT O. - Ovachita Belt bibliography.
- FEDER, HOWARD M. - the deep benthic environment in Port Valdez, Prince William Sound, Alaska; the feeding biology of the sea star *Pycnopodia helianthoides* in Prince William Sound, Alaska; the deep benthos in Prince William sound 16 months after the Exxon Valdez oil spill; the macrofauna (infauna and epifauna--which includes large numbers of sea-star species) in the southeastern Chukchi Sea.
- FERAL, JEAN-PIERRE - structure of habitat and dispersal strategies; effects of developmental modes on genetic structure and evolutionary processes (mainly in echinoids - annelids and molluscs also used).
- FERGUSON, JOHN C. - madreporite functions and water volume relationships in echinoderms - currently on echinoids and holothuroids.
- FERNANDEZ, CATHERINE - growth, nutrition and biochemical composition of sea urchin *Paracentrotus lividus* in rearing fed with different types of artificial food.
- FERRIER, DREW - Ophiuroid ecology (distribution, feeding and behavior).
- FLAMMANG, PATRICK - Adhesion in echinoderms: An integrated study - biomechanical, morphological, molecular - of tube foot temporary adhesion, Cuvierian tubule adhesion, and larval fixation.
- FOLLOSCO, MINDA P. - artificial culture of economically important sea cucumber.
- FORET, TIMOTHY W. - regeneration rates of *Luidia* in the field and the energetics of regenerative development; have begun thesis examining the prevalence of subcuticular bacteria in Gulf Coast (Florida) asteroids.
- FOSTER, MERRILL W. - Ordovician echinoderms from western Virginia; Atlantic Ocean brachiopods; Antarctic and subAntarctic brachiopods; paleobiology of Pennsylvanian invertebrates in Illinois.
- FOX, DAVID J. - analysis of articulation in the arms of *Ophiocoma echinata* and *Ophiocoma wendtii*.
- FRANKEL, EDGAR - coral reef lagoon sedimentation; coastal lakes, N.S.W.; volcanic ash - Mediterranean Sea; tectonics - eastern Mediterranean sea (ODP160).
- FREEMAN, STEVEN M. - impact and population dynamics of seastar predation on sublittoral communities. In particular, *Astropecten irregularis* on soft-bottom communities and *Asterias rubens* on commercial mussel beds, off the coast of Anglesea, North Wales; the relationship between the sea star *Astropecten irregularis* and its commensal polyniid *Acholoe astercola*.
- FRONTANA URIBE, SARITA CLAUDIA - taxonomic and distributional study of invertebrates from Clipperton Island, including echinoderms.
- FUJITA, TOSHIHIKO - biology of *Coscinasterias acutispina*; ecology of Recent and fossil *Ophiura sarsii*; ophiuroid's vertebrae (morphology, age determination); taxonomy of ophiuroids and asteroids.
- FUKUYAMA, ALLAN K. - looking at recovery of intertidal invertebrates in Prince William Sound, Alaska following the 1989 Exxon Valdez oil spill and am particularly interested in molluscan and echinoderm assemblages and the

contrast in recovery patterns between areas that were treated with hot-water, high pressure treatment with areas that were oiled and untreated.

GAGE, JOHN D. - deep-sea biology: shelf-edge benthic fluxes, and sediment community dynamics; deep-sea brittle star growth, spatial distribution and demographic modelling.

GAGNON, JEAN-MARC - bioturbation by and foraging behaviour of deepwater echinoderms: observations in mesocosms.

GALLEMI, JAUME - Cretaceous echinoids (Tethyan - worldwide); systematics, biostratigraphy and palaeoecology.

GARRISON, ROB - sea urchin aquaculture.

GEBRUK, ANDREY V. - deep-sea holothurians (order Elasipodida and, in part, Family Synallactidae).

GENTIL, FRANCK A. - population dynamics of ophiuroid species in soft-bottom community of the English Channel.

GEORGE, SOPHIE B. - maternal effects on larval growth and development of echinoderms; morphological and behavioral responses of echinoderm larvae to salinity gradients.

GIBSON, MICHAEL A. - continuing work on biotic interactions of Lower Devonian of West Tennessee; also studying traces of echinoids from the Coon Creek Formation (Cretaceous) and the tiering relationships present within the ichnofauna.

GIL CID, DOLORES - Cambrian and Ordovician echinoderms and trilobites from Spain; palaeological aspects, morphology and function.

GINANOVA, TALIA T. - Muscle regeneration in holothurians.

GIUDICE, GIOVANNI - regulation of heat shock protein (hsp) synthesis in sea urchin embryos; apoptosis in sea urchin development; regulation of ribosomal RNA synthesis in sea urchin (*Paracentrotus lividus*) development.

GLUCHOWSKI, EDWARD L. - Fammenian crinoids from the Holy Cross Mts, South Poland.

GOGGIN, LOUISE C. - biological control of the northern Pacific seastar; *Asterias amurensis* in Australian waters.

GOLDBERG, ARTHUR S. - investigating antiarthritic properties of echinoderms.

GONGADZE, GURAM - Late Cretaceous and Paleogene echinoids of the Caucasus (classification, paleobiogeography, stratigraphy).

GOODING, RICHARD U. - Animals associated with Caribbean diadematids; animals associated with diadematid echinoids, worldwide.

GORCHAKOV, IGOR - Population ecology and ecophysiology of *Asterias rubens* (organismal, cellular, genetic) in the White Sea.

GRABOWSKY-KAAIA, GAIL L. - Albatross recolonization project via the Audubon Society and HI Dept. of Fish and Wildlife.

GREENSTEIN, BENJAMIN J. - taphonomy of crown-of-thorns starfish; comparative taphonomy of caribbean reefs;

mode of formation of Pliocene shell beds.

GREENWOOD, AMY - Reproductive cycle of *Asterina phylactica*; Population dynamics, brooding success and juvenile growth rates of *A. phylactica* in Lough Hyne; Seasonality of echinoderm plankton; Fertilization kinetics in *Marthasterias glacialis*.

GROSJEAN, PHILIPPE - Biology of the European violet sea urchin *Paracentrotus lividus* under intensive cultivation.

GROVES, CATHY - *Heliaster* biogeography and systematics.

GRYGIER, M.J. - 1) identification of a few samples of Myzostomida sent by colleagues (G.Hendler, I. Kogo); 2) trying to isolate and identify a common, ophiuroid-infesting copepod from California, discovered by Gordon Hendler. 3) evaluating the possibility of posthumously publishing the late Paul Illg's decades-long study of two undescribed species of the ascothoracidan crustacean genus *Dendrogaster*, which infest several starfishes in the Pacific Northwest.

GUENSBURG, THOMAS E. - edrioasteroids, early crinoids, paleoecology of echinoderms.

GUERRAZZI, MARIA C. - natural history and the feeding behavior of the starfish *Echinaster brasiliensis*.

GUILLOU, MONIQUE - REPRODUCTION/RECRUITMENT: responses of sea-urchin population to environmental changes; BIODIVERSITY: seaweed-urchin interaction .

GURREA, ISIDRO - echinoids from the Cretaceous and Cenozoic age, Mediterranean region (specifically Western Europe).

GUTT, JULIAN - polar benthos ecology.

HADEL, VALERIA FLORA - Biology and ecology of echinoderms.

HAGEN, NILS T. - sea urchin outbreak dynamics: ecological interactions in a macroparasite/sea urchin/kelp forest system. Echiniculture/closed cycle cultivation of sea urchins: broodstock management, photoperiodic control of gametogenesis, growth, feeding, design of cultivation equipment.

HAMEL, JEAN-FRANCOIS - I am currently working on the ecology of juveniles and adults of the tropical sea cucumber *Holothuria scabra* in the Solomon Islands, and on the northern sea cucumber *Cucumaria frondosa* in the St. Lawrence Gulf and Estuary, eastern Canada. My main fields of research include chemical ecology, reproductive biology, spawning, settlement and daily cycles (movement, feeding, etc.).

HAMZA HASSAN, MOHAMED - ecology and biology of echinoderms from Gulf of Suez - Red Sea.

HAND, CLAUDIA - conducting stock assessments and biological studies for our local west coast species of sea cucumber, *Parastichopus californicus*, distribution, abundance and productivity.

HAUDE, REIMUND - stratigraphy and constructional morphology of scyphocrinoids; Devonian and Carboniferous holothuroids; Lower Devonian echinoderms of Argentina.

HAVARDSSON, BJORGOLFUR - the effect of caroteins in feed and environmental temperature on the gonad color and gonad development of the sea urchin *Strongylocentrotus drobachiensis* (Mueller, 1776). The purpose of the experiment is to develop feed suitable for controlling the quality of the urchin gonad in echinoculture.



- HEINZELLER, THOMAS E. - comparative, mainly neuroanatomical, morphology (TEM, histochem.) of crinoids with special attention to milleri-, bourgeti- and cyrtocrinids; entoparasitic myzostomids of crinoids, mutual effects on host and parasite on an ultrastructural basis.
- HENDLER, GORDON - behavior and functional morphology of deep-sea ophiuroids; taxonomy of Okinawan ophiuroids (with S. Irimura); systematics and natural history of eastern Pacific ophiuroids.
- HERDENDORF, CHARLES E. - invertebrate fauna associated with deep-sea (>2000 m) shipwrecks; invertebrate fauna of New Zealand (North Island) estuaries and tidal flats; brisingid fauna of North Atlantic Ocean; echinoid (esp. sand dollars) invasion of New Zealand estuaries following diversion of freshwater inflow.
- HESS, HANS - New starfish from the Middle Jurassic (Bajocian) of northern Switzerland; Crinoid ossicles from the Lower Jurassic (Pliensbachian of Arzo, Switzerland; Remains of Saccocomids from the Upper Jurassic of Germany (Sieverts-Doreck collection, on loan from Stuttgart Museum).
- HICKMAN, JR., CLEVELAND P. - Development of field guides for the identification of Galapagos marine invertebrate life.
- HIGHSMITH, RAYMOND C. - intertidal studies in Cook Inlet, Alaska.
- HILBUN, NANCY L. - Echinoderms of Yucatan Peninsula, Mexico for masters thesis.
- HILL, ROBERT B. - Local degeneration in sea cucumber body wall. Close apposition of cells in holothuroid LMBW.
- HOBERG, MAX K. - investigating the feeding biology of the sea star *Pycnopodia helianthoides* from eelgrass habitats in Prince William Sound following the Exxon Valdez oil spill.
- HODGSON, ALAN N. - spermatozoan morphology of *Patiriella*.
- HOFFMAN, JENNIFER - interactive effects of ultraviolet radiation and temperature in echinoid embryos; variations in UV sensitivity among echinoid species and populations; effects of and defenses against UV in echinoid embryos.
- HOLTERHOFF, PETER F. - Late Paleozoic crinoid paleoecology and systematics; P-Tr extinction and eradication of the Crinoidea.
- HOOVER, ROBERT G. - aquaculture of *Strongylocentrotus drobachensis*.
- HOSHI, MOTONORI - molecular mechanism of sperm-egg interactions in starfish and sea urchins; structure and function of glycosphingolipids in starfish and sea urchins; 1-methyladenine signal transduction in starfish oocytes.
- HOTCHKISS, FREDERICK H.C. - echinoderm pentamerism; teratology of sea stars; Paleozoic ophiuroid morphology, evolution and classification; isolated ophiuroid vertebrae and ossicles, Devonian, Bohemia (with Petr and Prokop); new Canadian finds of Ordovician stelleroids (with D.M. Rudkin); ophiuroids from Upper Windsor Group, Mississippian, Nova Scotia (with P. von Bitter).
- HOTTENROTT, SUSAN I. - Dissertation research on the phylogeny of the family Ophiolipidae using morphological features and perhaps sequences. Revision of the genus *Ophiomusium*.
- ILAN, MICHA - the study of sponge chemical (and structural) defenses against echinoderm predators; echinoderms which live in association with sponges; the impact of coral reef sea urchins on corals recruitment.

IRIMURA, SEIICHI - taxonomy of Japanese Ophiuroidea; SEM observation on disk granules of Ophiuroidea; vertebra form of Ophiuroidea.

IVY, W. GRISILDA - seed production and sea ranching of sea cucumbers.

JABLONSKI, DAVID - onshore-offshore and latitudinal patterns in the origins of higher taxa, and their subsequent shifts in environmental and latitudinal distribution; studying post-Paleozoic echinoids and stalked crinoids; studying mainly molluscan but some echinoid mass extinction and recovery patterns, especially at the Cretaceous-Tertiary boundary.

JACOBSEN, NANCY A. - identification and logging of occurrences of invertebrates, vertebrates and geologic features in the Monterey Bay; working especially with asteroidea analysis (WWW images and information will be available in the near future).

JAECKLE, WILLIAM B. - nutrient distribution among tissue in planktonic larvae of echinoderms; asexual reproduction by asteroid larvae; sites and mechanisms of nutrient assimilation by larvae.

JAGT, JOHN W.M. - Latest Cretaceous-early Palaeogene echinoderms (holothurians excepted) from type area of the Maastrichtian Stage; late Maastrichtian echinoderm- 'lagerstatte' with bourgueticrinine crinoids and ophiolipidid and ophiacanthid ophiuroids; high-diversity ophiuroid faunas of Campanian and Maastrichtian age from northeast Germany (with M. Kutscher).

JAMES, DANIEL B. - Seed production and culture of the sea cucumber *Holothuria scabra*.

JAMIESON, GLEN S. - sea urchin abundance surveys; near-shore community population dynamics.

JANIES, DANIEL A. - phylogenetic analyses of the evolution of development among asteroids.

JEFFERIES, RICHARD P. S. - The origin of tunicates on the basis of fossil evidence.

JEFFERY, CHARLOTTE H. - Maastrichtian and Palaeocene echinoids; larval strategy in recent and fossil Temnopleuroid echinoids.

JELL, PETER A. - Australian Palaeozoic echinoderms. Just completing a volume of Memoirs of the Queensland Museum which will include:- Silurian and Devonian crinoids of Victoria; Lower Devonian echinoderms (crinoids, blastoids asterozoans) of the Bokkeveld Series in South Africa; Upper Devonian crinoids of the Canning Basin, WA; latest Ordovician to Devonian carinoids of Victoria (4 papers with Marcello Ruta); Carboniferous and Permian crinoids of Australia (2 papers with Gary Webster).

JOHNSON, SONKE - absorption spectra of echinoderm visual pigments.

JUINIO-MENEZ, ANNETTE R. - culture and population genetics of marine invertebrates (sea urchin); development of mass culture techniques for *Tripneustes gratilla*.

JUNQUEIRA, ANDREA O.R. - population dynamics of echinoids.

KASYANOV, VLADIMIR L. - cellular mechanisms of reproductive strategies of marine invertebrates.

KAWAUCHI, GISELE YUKIMI - reproduction and dispersion - apodous holothurians.

KELLEY, SCOTT L. - Cretaceous echinoids of Texas; Cretaceous comatulid crinoids of Texas.

- KELLY, MAEVE S. - feasibility of commercial echinoculture in Scotland (*Psammechinus miliaris*); echinoderm/subcuticular bacteria symbioses.
- KERR, ALEXANDER M. - ecology, character evolution, diversification and molecular systematics of aspidochirote holothuroids.
- KEUSKAMP, DOM - recruitment of the endemic New Zealand echinoid *Evechinus chloroticus* (Echinometridae). Specifically focussing on settlement variability, natural recruitment variability, and experimental manipulation of processes operating immediately post-settlement (using cultured recruits), as well as aspects of development and the chemical ecology of settlement. Especially interested in the effects of sediment on survivorship during and after settlement, and techniques available to determine the nature of these effects. Also, the peculiarities of a marine reserve (as my major study site). Determining the relative influence these processes have on recruitment at several scales may have implications for the (small) roe fishery in New Zealand.
- KLINGER, THOMAS S. - digestion in echinoids, asteroids, and holothuroids; population biology of tropical holothuroids; manufactured feeds suitable for the mariculture of echinoids.
- KNOTT, K. EMILY - A comprehensive phylogeny of the Asteroidea (using molecular techniques; hopefully with representatives from every family). A study of the molecular events involved during asexual reproduction in asteroid larvae. An analysis of possible gene flow between trans-Atlantic asteroid species.
- KOBAYASHI, NAOMASA - marine pollution bioassay by using sea urchins; spawning periodicity of sea urchins.
- KOGO, ICHIZO - Class Crinoidea - taxonomy.
- KRISHNARAJAH, PADMINI - holothuria fishery in Jaffna lagoon, northern part of Sri Lanka.
- KURIHARA, TAKEO - activity rhythm of sea-star; distributional patterns of sea-star.
- KYTE, MICHAEL A. - ophiuroid (worldwide) and asteroid (NE Pacific) taxonomy and behavior; sea cucumber ecology.
- LAMBERT, PHILIP - description of two new species of *Pentamera* and a Phylloporid (Holothuroidea) from the west coast.
- LANDEIRA, ANA MARIA - characterization of a Ca<sup>2+</sup>-atpase from sea cucumber muscle.
- LANE, DAVID J.W. - The Echinodermata: a biological tool for the control and protection of marine benthic environments in Singapore waters.
- LANE, N. GARY - completing three papers on Famennian (latest Devonian) crinoids from China, Britain, and Germany.
- LAWRENCE, JOHN M. - Characteristics of arm regeneration in starfish; comparative nutrition of sea urchins.
- LE MENN, JEAN - Paleozoic North-African crinoids (calyx and dissociated columnals); benthic communities, polymorphs and medium to high frequencies cycles.
- LEE, YOUN-HO - phylogenetic analysis of Korean east coast sea urchins; phylogenetic analysis of the antarctic sea urchin, *Sterechinus neumayeri*; analysis of spicule matrix protein gene expression in sea urchin embryos.

- LEISMAN, JULIANNE - recruitment study of brittlestars in the Banana River; also, aspects of regeneration.
- LESSER, MICHAEL P. - molecular biology of photoperiod regulation of gametogenesis in sea urchins; Identification and transmission of bacterial symbionts in *Amphipholis squamata*.
- LESSIOS, HARILAOS A. - molecular phylogeny of *Diadema*; gene flow in sea urchins; population dynamics of *Diadema antillarum*; effects of sea urchins on coral recruitment.
- LEVERONE, JAY R. - reproductive cycles of *Astropecten* and *Luidia* in lower Tampa Bay.
- LEVIN, VALERY S. - shallow water Holothuroidea; systematics, biology feeding and fisheries.
- LEVITAN, DONALD R. - ecological and evolutionary consequences of sperm limitation in echinoderms; echinoid grazing pressure in the Caribbean.
- LIAO, YULIN - Fauna Sinica: Echinodermata: Ophiuroidea.
- LITVINOVA, NINA M. - Revision of the genus *Ophiomyces* (Ophiacanthidae); new species and genus *Ophiuraster* (Ophiuridae); ophiuroids of New Caledonia.
- LORDSON, JINBERT - seed production and sea ranching of sea cucumbers.
- LOVELY, ERIC C. - coexistence of hydroid predators in *Tubularia* larynx colonies.
- MACURDA, JR., D. BRADFORD - modern crinoids and blastoids.
- MACZYNSKA, STEFANIA S. - Cretaceous and Tertiary echinoids particularly from Poland.
- MAGSINO, RICHARD M. - population genetics of the blue-coral reef starfish *Linckia laevigata*. The techniques used in the analysis of its population structure in relation to gene flow levels among populations in the South China Sea are the protein allozyme electrophoresis and RFLP (restriction fragment length polymorphism) analysis of PCR-amplified products of its mtDNA.
- MAH, CHRISTOPHER L. - I am working on a PhD with Dr. Daniel Blake continuing my studies on the systematics of starfish. I am anticipating research on the Goniasteridae, but am still happy to occasionally id slides and specimens, so please feel free to contact me.
- MAHARAVO, JEAN - study about proliferation of *Salmaciella erythraxis* in Ambaro Bay (Nosy-Be) Northwest coast of Madagascar.
- MAIER, MARTA S. - isolation and structural elucidation of secondary polar metabolites from echinoderms of the South Atlantic Ocean.
- MAKRA, ATHENA - arm regeneration in *Acrocnida brachiata* (Ophiuroidea); microdistribution of *A. brachiata* in Little Killary, west coast of Ireland bioturbation.
- MALLEFET, JEROME C. - luminescent ophiuroids; morphological, physiological, ecological aspects.
- MANIKANDAN K.P. - I am working in a research and development company in the Maldives (Mais Marine Seacucumber Research Centre, Bandaveri, Raat Atoll, Republic of Maldives - \*no postal service). We in our research centre are trying to commercialize seacucumber hatchery and growout. In our R&D Programme we have produced

about 65,000 juveniles at 6% survival rate. From the start of my research career, I was fully interested in the embryology of sea cucumbers, particularly in *Holothuria scabra*. At present we have attained an increase in our survival rate from 5% to 15% without using sterilized seawater. We hope to increase it still more by using microbe-free-water. We are using different algal diets for its growth which to our excitement has affected greatly its metamorphosis and cycle duration. I am still carrying on my research by making sea cucumber hatchery and culture a commercial one in par with that of shrimp culture.

MANNI, RICCARDO - Evolutive trends and morphofunctional analyses of Cyrtocrinids.

MANNIFIELD, KAY - Dinantian crinoids from northwest Ireland; exploring Camerate ?extinction; crinoid palaeoecology, autecology and palaeobiology; also looking at carbonate reefal environments etc.

MANSO, CYNTHIA L.C. - The echinoids from the middle Cretaceous of the Sergipe Basin (Brazil).

MAPLES, CHRISTOPHER G. - Devonian-Permian crinoid and blastoid paleobiogeography rebound from mass extinction; Late Paleozoic invertebrate paleoecology.

MARAN, ALEKSANDRA A. - Palaeoecological research of Lower Cretaceous Echinoidea from eastern Serbia (YU); irregular echinoids, especially genus *Heteraster*, *Toxaster*, (Spatangoids) and *Holaster*, biostratigraphy, palaeoecology, taphonomy; Cretaceous echinoids from Serbia (YU); Lower Cretaceous echinoids (Urgonian) and accompanying macro and micro fauna; Lower Cretaceous foraminifers (Orbitolinids).

MARCOS-DIEGO, CONCEPCION - study of benthic fauna and flora from the southern of the Livingston Island (South Shetland, Antarctica).

MARSH, LOISETTE M. - guide to the shallow-water echinoderms of Australia.

MARTIN, RICHARD B. - ballast water transportation of non indigenous species (including *Asterias amurensis*); community monitoring for non indigenous species (including *Asterias amurensis*).

MARTINEZ, PRISCILLA C. - population and reproductive biology of the sea cucumber *Isostichopus fuscus* in the Galapagos Islands.

MASCARENHAS, BERNARDO JOSE DE A. - pattern of distribution of asteroidea from Guanabara Bay, Rio de Janeiro, Brazil.

MASON, JOANNE C. - reproductive behaviour of echinoderms.

MASSIN, CLAUDE - holothurian taxonomy; Easter Island, Indonesia, Papua New Guinea.

MATA PEREZ, EUSTOLIA - taxonomic study of the asteroid genus *Luidia* from the eastern-Pacific.

MATERIA-ROWLAND, CHRISTINE J. - developing a manual on coastal and marine monitoring; biological analysis and sediment chemistry analysis of the impact of the aquaculture industry on benthic fauna.

MATTOS-SEGOVIA, ELIO - the assessment of bioinducers of the settlement in larvae of sea urchin *Loxechinus albus*.

MAUBON, ROGER M. - preparing inventories (or catalogs) of historical collections of Echinoderms in institutions like Museum of Nancy (Paul Thiery), Museum of Chambéry (Savin, Demoly) and Museum of La Rochelle; addendum (1998) to inventories (1994) of echinoderms in Grenoble, Museum of Natural History.



McBRIDE, SUSAN C. -

1. Density/ration study with small (25 mm) *Strongylocentrotus franciscanus* using the extruded diet most recently developed by J.M. and A.D. Lawrence. Planned duration - 6 months.
2. Growth study of small (15 mm) *S. franciscanus* using *Nereocystis luetkeana* and the extruded diet - planned duration 1-2 years.
3. Growth study with medium (40 mm) *S. franciscanus* using the extruded diet - planned duration - 1 year.
4. Growth study of *Parastichopus californicus* using 30, 40 and 50% protein meals developed by Lawrence and Lawrence and the extruded diet.

McCLINTOCK, JAMES B. - chemical ecology of echinoderms from the Gulf of Mexico and Antarctica.

McEDWARD, LARRY R. - simulation models of larval planktotrophy in marine invertebrates; effects of endosulfan on larval development of sea urchins.

McGOVERN, TAMARA - I am studying gender-specific clonal reproduction in the brittle star *Ophiactis savignyi* as well as costs associated with clonal and sexual reproduction in both sexes. I am also using molecular methods to examine clonal structure in populations of this species and to determine if the clone sizes of female and male clones are consistent with gender-specific patterns of clonal division rates observed in field experiments.

McKENZIE, J. DOUGLAS - subcuticular bacteria in echinoderms; antifouling mechanisms of echinoderms.

McLELLAND, JERRY A. - identification and ecology of the local echinoderm fauna from the Gulf of Mexico and Caribbean areas.

McNAMARA, KENNETH J. - Neogene species of the clypeasteroid *Peronella* from Western Australia; Paleocene spatangoids from the Carnarvon Basin, Western Australia; Miocene echinoids from the Carnarvon Basin, Western Australia; Eocene echinoids from the Bremer Basin, Western Australia; fauna of Australia - spatangoids, holasteroids, clypeasteroids, cassiduloids (with Rich Mooi); general echinoid morphology, physiology and biogeography.

MEDEIROS-BERGEN, DOT E. - selective constraints on brittlestar life histories.

MEIJER, LAURENT - molecular mechanisms of cell cycle regulation, using starfish oocytes and sea urchin embryos as cellular models; circadian control of the cell division cycle; identification of novel anti-mitotic compounds, with potential anti-tumor activity, using mechanism-based screening assays (purified cell cycle regulating enzymes; detection of inhibitors of cell cycle regulating enzymes in extracts prepared from marine invertebrates (collaboration with Dr. G.R. Pettit, Cancer Research Institute, Arizona State University, Tempe, Arizona).

MELIKOV, OKTAI HAMZA - investigation, evolutionary, systematic and development of orders Spatangoid, Holasteroid and Holoctypoid of Azerbaijan (late Cretaceous and Eocene).

MESSING, CHARLES G. - A phylogenetic revision of the families of comatulid crinoids and the genera of Comasteridae; Growth, ecology and taphonomy of isocrinid crinoids; An artificial key to the genera of stalked crinoids; Faunistic studies of tropical Indo-West Pacific comatulid crinoids.

MEYER, CHRISTIAN A. - Tertiary asteroids from the Eggenburg area (Austria); Fossilium catalogus Austriae, Part Asterozoa.

MEYER, DAVID L. - paleoecology and taphonomy of the crinoid *Uintacrinus* (Late Cretaceous). With Clare Milsom, Christopher G. Maples and Andrew Webber. Crinoid morphology across a sequence boundary: Kope to Fairview Formations, Upper Ordovician, Cincinnati Arch region. With Arnold I. Miller, Benjamin F. Dattilo, and Steven M. Holland.

- MILLER, ROBERT J. - evolution and biogeography of the Elaspoda (Holothuroidea).
- MIRONOV, ALEXANDER - 1) Taxonomy of the deep sea echinoderms (echinoids of the order Holasteroidea, stalked crinoids of the suborder Bourgueticrinina, asteroids of the family Porcellanasteridae and holothurians of the family Myriotrochidae). 2) Biogeographical history of the deep sea echinoderm fauna.
- MITROVIC-PETROV, JOVANKA R. - study of some Cretaceous and Neogene echinoids of Serbia and Monte Negro (taxonomy, paleoecology, functional morphology, taphonomy); study of some Cretaceous and Neogene echinoids of Greece (together with A. Marcopoulou-Diacantoni - Athens).
- MLADENOV, PHILIP V. - biology, ecology and population genetics of asexual echinoderms; parthenogenesis in echinoderms; population and evolutionary genetics of *Amphipholis squamata*; sea cucumber fisheries of the Cook Islands; ecology and systematics of New Zealand brittle stars.
- MONTAGUE, CHRISTOPHER - regeneration capabilities of sea stars in closed systems.
- MOONEY, ROBERT C. - red sea urchin (*Strongylocentrotus franciscanus*) management by the Hesquiaht First Nation: implications for community structure and the successful establishment of a commercial sea urchin fishery.
- MOORE, ABIGAIL M. - trying to set up a community-based project aiming to combine consensus-based local management of marine resources with various other initiatives to improve the economic and educational status of the villagers. This may be combined with trials of reef repair system and re-seeding of some species. Also possible involvement in one or more holothurian pen-culture projects for rearing juveniles to maturity before processing them.
- MORGAN, ANDREW - I have started my PhD on the ecology and culture of the sea cucumber *Stichopus mollis* and am supervised by Dr. Russ Babcock, School of Environmental and Marine Science, Leigh Marine Laboratory, University of Auckland. We have secured industry funding for the next three years in a cooperative venture with the abalone industry. The PhD project involves production of seed, grow-out and farming, polyculture and fisheries research.
- MORGAN, KATHERINE - lecithotrophy in starfish; the evolution of developmental patterns and life cycle evolution.
- MORRILL, JOHN B. - Experimental analysis of primary invagination in the sea urchin, *Lytechinus variegatus*; Descriptive morphology of the embryonic development of the sea urchin, *Echinometra lucunter*.
- MOTOKAWA, TATSUO - biology of stalked crinoids; catch connective tissue.
- MOUCHATY, SUZETTE - molecular systematics of the Mellitidae.
- MUKAI, HIROSHI - ecosystem study in tropical and boreal seagrass beds; bioturbation and restructuring effects on material flow at interface of sea floor.
- NAIDENKO, TAMARA K. - cryopreservation of sea urchin embryos and larvae bioassay by using sea urchin eggs and embryos.
- NAKAI, SAORI - echinoids of the family Temnopleuridae.
- NAKAMURA, RAYMOND K. - developing science programs and exhibits.
- NAKANO, EIZO - The role of extracellular matrix in development.

- NEBELSICK, JAMES H. - taphonomy of reef echinoids; Lower Miocene echinoid palaeobiogeography.
- NEILL, BRUCE J. - biogeography, systematics and population biology of echinometrids.
- NEPOTE, ANA CLAUDIA - holothurians of Marietas islands, Nayarit, Banderas Bay, Mexico; systematics of holothurians of Banderas Bay, Mexico (central Pacific).
- NESTLER, HELMUT - Maastrichtian echinoids from the chalk of Rugen (North Germany); Cretaceous echinoids from South Yemen.
- NEUMANN, CHRISTIAN - Cretaceous irregular echinoids: taphonomy and predation; post-larval development of the sand dollar *Leodia sexiesperforata*; Cretaceous echinoids of Texas.
- NICHOLS, DAVID - reproductive cyclicity in the New Zealand crinoid *Oxycomanthus plectrophorum*; seasonality in resource allocation in the English Channel starfish *Luidia ciliaris*.
- NICOSIA, UMBERTO - Systematics and evolutive trends of Cyrtocrinids.
- NISHIHARA, MORITAKA - effect of heart urchins on coral community structure of the sandy bottom.
- NISHIZAKI, MICHAEL T. - fluid dynamic influences on the growth and survival of juvenile sea urchins (*Strongylocentrotus franciscanus* and *S. purpuratus*) - for MSc started Sept 1998 at University of Northern British Columbia.
- NOJIMA, SATOSHI - feeding effects of *Acanthaster planci* on recruits of corals.
- O'CONNOR, BRENDAN D. - bioturbation rates of infaunal echinoderms; connection between hydrographic features and high density ophiuroid populations.
- O'HARA, TIMOTHY D. - echinoderms of Macquarie Island (final stages); patterns of diversity for faunal assemblages on subtidal reefs off central Victoria (Ph.D. thesis, University of Melbourne).
- OJEDA, F. PATRICIO - ontogenetic changes in the diet of *Loxechinus albus*: an ecophysiological approach. Ecology of intertidal rockpools: role of sea urchins and fishes in determining community patterns.
- OJI, TATSUO - paleontology and biology of stalked crinoids; especially regeneration of crown and arms, and evolutionary history of isocrinines.
- OLSZEWSKA-NEJBE, DANUTA - studying the irregular echinoids in the North European Province; stratigraphy and paleobiogeography.
- OLVER, JANE - Mesozoic irregular echinoids; extant British species.
- PABIAN, ROGER K. - Systematics, paleoecology, biostratigraphy of late Pennsylvanian-early Permian crinoids, North American midcontinent, with emphasis on epifauna, parasites, commensals, prey-predator relationships.
- PAGETT, RICHARD M. - Caspian Sea: literature review.
- PARDO, ROBERTO A. - ecology and population dynamics of echinoderms (particularly echinoids and ophiuroids) - currently, population dynamics of sand dollars.

- PARMA, SARA GRACIELA - Cretaceous and Tertiary echinoids from Patagonia and La Pampa Province, Argentina.
- PAULS, SHEILA MARQUES - distribution of the echinoids in coral communities.
- PENCHASZADEH, PABLO E. - Ecology of sand dollars (*Mellita* spp.); trophic ecology of asteroids.
- PENNINGTON, J. TIMOTHY - primary production in the central California upwelling zone; brachiopod larvae of the Monterey Bay Submarine Canyon.
- PEREZ-RUZAFÁ, ANGEL - wetlands and coastal lagoons of Galapagos Islands (Ecuador) - basis for its protection and management; Iberic fauna; study of benthic fauna and flora from the southern of Livingston Island (South Shetland, Antarctica); design of new algorithms for the primary productivity and water quality prediction in coastal zones using remote sensing techniques.
- PETR, VACLAV - preparation of a photographic, comprehensive book, "Atlas of Echinoderms of the Barrandian area". This book will be written in English and published at the end of 1998.
- PETROVA, IRINA YU. - Structure and functions of echinoderms lectins.
- PHILIPPE, MICHEL - Miocene echinoids.
- PIEPENBURG, DIETER - ecology of brittle stars in Arctic and Antarctic seas.
- PODOLSKY, ROBERT D. - biochemistry of temperature adaptation in gametes of *Strongylocentrotus* spp.; evolution of egg accessory structures in free-spawning invertebrates
- PORTELL, ROGER W. - echinoid biostratigraphy of Florida (especially undescribed Miocene taxa); occurrence of phosphatic echinoids, brachiopods, and annelids from the Upper West Florida slope, eastern Gulf of Mexico.
- PRESTEDGE, GEOFFREY K. - study of Pittwater, S.E. Tasmania, re: the regrowth of *Zostera* sp., also *Codium* sp. beds now that nutrient levels in the water have decreased with upgrading of local sewerage treatment plants, and to see if several species of echinoderms return if the above species of algae recover sufficiently.
- PUTCHAKARN, SUMAITT - echinoderms associated with some sponges in coral reefs along the eastern coast of the Gulf of Thailand.
- RAJAKUMAR, C. P. - biology and ecology of certain Indian echinoderms; investigating the bioactive substances of Indian echinoderms.
- RAM MOHAN, M. K. - Ph.D. project on the reproductive cycles of *Holothuria atra*.
- REGIS, MARIE-BERTHE - population dynamics of regular echinoids in the Mediterranean; enzymatic study of the nutrition of *Paracentrotus lividus* (Echinodermata: Echinoidea)
- REICH, MIKE - revision of the fossil holothurian parafamily Priscopedatidae Frizzell & Exline, 1956 (Ordovician-Quaternary)[in collaboration with Prof. Dr. H. Mostler, Innsbruck]; Silurian holothurians from the Isle of Gotland (Sweden); Campanian and Maastrichtian holothurians from Europe; fossil isolated calcareous ring elements of Holothuroidea (Palaeozoic and Mesozoic); Silurian ophiocistoids from the Isle of Gotland (Sweden) [in collaboration with M. Kutscher, Sassnitz].
- REY, DANIEL - Cretaceous and Tertiary echinoids of Spain.

RINELLI, PAOLA - National and international trawl-surveys projects (GRUND; MEDITS) for the evaluation of demersal resources (in which the macrobenthic fauna is studied with trawl net as well as grab and dredge).

ROBINSON, SHAWN M.C. - green sea urchin fishery ecology; roe enhancement of the green sea urchin; development of artificial diets for sea urchins.

ROCCATAGLIATA, ALEJANDRO J. - chemistry of physiologically active compounds isolated from starfishes and brittle stars in the South Atlantic Ocean.

RODRIGUEZ, SEBASTIAN R. - subtidal brown macroalgae forests as food sources for intertidal organisms: role in determining community patterns in the rocky intertidal environment.

ROGERS-BENNETT, LAURA - examining the impact of larval feeding history on the growth and success of newly settled red sea urchins; examining the survival of newly settled urchins exposed to micro-predators in the benthos; spatial patterns in the growth and survival of juvenile red abalone.

ROSE, EDWARD P.F. - Jurassic irregular echinoids; Cenozoic holoctypoid echinoid *Echinoneus*.

ROTMAN CLARK, HELEN E.S. - systematics of Southern Ocean asteroids and ophiuroids.

ROUX, MICHEL - Taxonomy, ontogeny, ecology of recent and fossil Articulata (Crinoidea).

ROWE, FRANK - Indo-west Pacific echinoderms and their systematics and zoogeography; Indian Ocean echinoderms with A.C. Campbell.

ROY, MICHAEL S. - Evolutionary history of *Amphipholis squamata*; Phylogeography and human influence in *Ophiactis savignyi* distributions; The effects of fiords on population structure of marine invertebrates; Developmental evolution of asteroids.

SABA, MASAKI - taxonomic studies of Japanese sea-stars.

SADLER, KIRSTEN - My research is focused on understanding regulation of the meiotic cell cycle and meiotic maturation of starfish oocytes. We are also interested in determining the species distribution and reproductive cycles of starfish living in the Sea of Marmara and The Bosphorus.

There are two ongoing projects in the lab which involve echinoderms:

1. Identification of the molecules involved in the signaling pathway leading from hormone stimulation of starfish oocytes to activation of the meiotic cell cycle.
2. Development of a protocol to cryopreserve starfish oocytes, eggs and embryos.

SAMYN, YVES - distribution and biodiversity of holothuroids along the Kenyan coast; feeding biology of commercial holothuroids from Kenya; reproductive biology of commercial holothuroids from Kenya; distribution and biodiversity of regular echinoids along the Kenyan coast.

SANFORD, ERIC - foraging behavior, recruitment, and growth of *Pisaster ochraceus*.

SANO, MINORU - population ecology of *Strongylocentrotus nudus*.

SASTRY, DWADASI R.K. - echinoderm fauna of Andaman and Nicobar Islands and their coral reefs.



SAUCEDE, THOMAS - the apical system as a key to understand the taxonomy and the phylogeny of the Pourtalesiidae (abyssal holasteroid sea urchins). Evolution of the apical system throughout the history of the Irregularia.

SCALLY, KEVIN - tooth form function and evolution of invertebrate dental systems, especially tooth sharpening behaviour (thegosis).

SCHELTEMA, RUDOLF S. - larval dispersal - most recently in the Antarctic.

SCHOPPE, SABINE - Shallow water echinoderms of the Philippines.

SCHUETZ, ALLEN W. - development of a new model for multiparameter analyses of perturbations of gametic and embryonic processes.

SCHULTZ, HEINKE - Identifying the Antarctic irregular echinoids of the Alfred-Wegener-Institute for Polar and Marine Research in Bremerhaven as a volunteer; interested in other irregulars too.

SEETO, JOHNSON - taxonomy of Fiji echinoderms.

SERAFY, D. KEITH - biogeography of Atlantic Ocean echinoids; Age and growth studies of *Echinarachnius parma*.

SEWELL, MARY - life-history and early development in echinoderms; temperature effects on larval development; holothurian reproduction and ecology; larval physiology.

SHEPHERD, SCORESBY A. - food web studies; comparison between abalone and sea urchins.

SHICK, J. MALCOLM - effects of UV on echinoid eggs and embryos; dietary accumulation of mycosporine-like amino acids by echinoids.

SHIRLEY, THOMAS C. - predator-prey and competitive interactions between sea otters, crabs and starfish in Glacier Bay, Alaska.

SIBUET, MYRIAM - deep sea ecology and deep sea echinoderms; cold deep environments; deep sea basins.

SKOLD, MATTIAS - The role of environmental factors in regulating sexual and asexual reproduction in sea stars. Genetics of sexual and asexual populations of the sea star *Coscinasterias muricata* around New Zealand. Population dynamics, growth, regeneration, feeding and predator-prey interactions in brittle stars. Structuring mechanisms in marine benthic populations; interactions between burrowing heart urchins (*Brissopsis lyrifera*) and brittle stars (*Amphiura chiajei*). Ecotoxicology and fate of contaminants in marine environments, especially infaunal brittle stars.

SLOAN, NORMAN A. - sea cucumber harvest on west coast of North America.

SMILEY, SCOTT - annotated catalogue of holothurians with synonymies; annual cycle of *Parastichopus californicus*, changing conditions of body wall muscles.

SMIRNOV, ALEXEI V. - Arctic echinoderms fauna; holothurians of the North Pacific; taxonomy of apodid and molpadid holothurians.

SMIRNOV, IGOR S. - taxonomic studies of arctic and antarctic ophiuroids, creation of illustrated computer key for arctic brittle-stars and data bases on ophiuroids of Arctic and Southern Oceans.

- SMITH, ANDREW B. - morphological and molecular phylogenies of echinoderms; Maastrichtian and Palaeocene echinoids.
- SOLIS-MARIN, FRANCISCO A. - ecology and molecular taxonomy of echinoderms in the North Atlantic (Ph.D., in progress).
- SOLOVJEV, ANDREY N. - Holasteroid and spatangoid echinoids (evolution, classification, paleoecology); echinoids on the Cretaceous/Paleogene boundary.
- SONNENHOLZNER, JORGE I. - systematic evaluation of the reef echinoderms at the Machalilla National Park, Manabi, Ecuador; ecology of the sand dollar *Mellita longifissa* Michelin intertidally at the Machalilla National Park, Manabi, Ecuador.
- SPENCER, LARRY T. - symbiotic relationship between *Holothuria atra* and the polka-dot crab in the Hawaiian sublittoral zone.
- SPIRINA, IRINA S. - Morphology and regeneration of respiratory trees in holothurians.
- SPIRLET, CHRISTINE - Starting new project at Universite de Mons-Hainaut (Belgium) in September: study of the impact of sand and gravel extraction on the coastal ecosystem, with emphasis on benthic organisms.
- SPONER, RENATE - molecular evolution of ophiuroids: phylogeny, phylogeography, population genetics in *Amphipholis squamata*, *Ophiactis savignyi*, *Ophiocoma scolopendrina*. (<http://www.dnapop.zi.ku.dk>)
- STANCYK, STEPHEN E. - population biology, predation and regeneration of *Ophiura sarsi*; sublethal predation of echinoderms; use of markers and growth rings of ophiuroid ossicles for age/growth studies.
- STEWART, BRIAN G. - reproductive biology of *Astrobrachion constrictum* and *Ophiopsammus maculata* (Echinodermata: Ophiuroidea); growth rate and reproduction in *Stichopus mollis* (Echinodermata: Holothuroidea).
- STICKLE JR., WILLIAM B. - effects of seasonal and latitudinal temperature variation on the physiology of the *Leptasterias* species complex.
- STOEHR, SABINE - Diversity in tropical Ophiuroidea.
- STORC, RICHARD - ophiuroids and asteroids from the Upper Cretaceous (Cenomanian-Turonian) of the Bohemian Cretaceous Basin (Czech Republic).
- STRATHMANN, RICHARD R. - developmental plasticity of larvae; limits on the aggregation of embryos; evolution of rates of development of embryos.
- STUMP, RICHARD J. - population dynamics of *Acanthaster planci* (L.)
- SUMIDA, PAULO Y.G. - ecology and ontogeny of the post-larval development in deep-sea ophiuroids.
- SUMRALL, COLIN D. - phylogeny of primitive Echinodermata; Edrioasteroid systematics; primitive echinoderm paleoecology.
- TABLADO, ALEJANDRO - systematics of Asteroidea from southwestern Atlantic and Antarctic Peninsula.
- TAKAHASHI, KEIICHI - physiology of the madreporite; physiology of echinoid spine muscle and catch apparatus;

motile mechanism of echinoderm sperm flagella.

TALBOT, TIFFANY D. - salinity tolerances and other factors of *Ophiophragmus filograneus*.

TAVARES, YARA A. G. - ecology, histology, morphology studies of *Mellita quinquiesperforata* in beaches of Parana's State, relation between morphodynamics and spatial distribution.

TELFORD, MALCOLM - collagen in tooth support mechanism of clypeasteroids; podial forces in *Asterias*; computer simulation of *Dendraster* distribution.

THANDAR, AHMED S. - Monograph of the southern African holothuroid fauna. Study of the deep sea holothuroids collected off the southern African east and west coasts.

THAPANAND, THANITHA - Population dynamics of fish and invertebrates of Thailand.

THIERRY, JACQUES - Jurassic (Mesozoic) echinoids - France and some western Europe countries; morphology and relation with palaeoenvironment changes (overall sea-level variation).

THORNDYKE, MICHAEL C. - Regeneration, neuronal development and regeneration, growth factors, gene-regulation of regeneration and response to environmental conditions.

THORSEN, MARIANNE S. - the ecophysiology of the irregular sea urchin *Echinocardium cordatum* - interactions with gut microbiota.

TIAGO, CLAUDIO - Biology of marine invertebrates, especially echinoderms.

TIEFENTHALER, LIESL - research on the red brittlestar *Amphiodia urtica*.

TOMINAGA, HIDEYUKI - biology of the sand dollar and heart urchin, especially key-hole sea urchins, brooding spatangoids and cidaroids, encompassing population study, growth, development, age determination.

TOMMASI, LUIZ ROBERTO - palaeobiogeography and modern biogeography of echinoderms in the South Atlantic and Antarctic regions (especially in Brazilian REVIZEE material - NE and SE Brazilian areas).

TRONCOSO, JUAN F. - identifying collections of Antarctic echinoderms in the Natural History Museum of Concepcion, Chile; studying several species of echinoderms from the Pacific coast Eight Region; the conservation problems of the echinoderms of Chile and their future projection.

TURON, XAVIER - Evaluation of sublethal impact of pollution on benthic invertebrates; reproductive strategies of ascidians and echinoderms; chemical defense mechanisms in sponges.

TUTERA, PETER - monograph of the irregular echinoids of Prydz Bay, Antarctica; new *Pachycentrotus* species.

UBAGHS, GEORGES J. - new echinoderms from the Upper Cambrian of the Montagne Noire (southern France).

UTHICKE, SVEN - Population genetics and stock size of commercially fished holothurians; asexual reproduction in holothurians.

V.JUTERZENKA, KAREN - ecology of Arctic ophiuroids and their function within the benthic food web (within the framework of AOSGE).

VADAS, ROBERT L. - ecology and reproductive biology of sea urchins along the coast of Maine. Funded by NOAA Sea Grant (1995-1997); temporal and spatial variability in reproduction and roe yield in green sea urchins. Tentatively funded by Maine Dept. Mar. Res. (1996-1997).

VADET, ALAIN - Triassic echinoids of St. Cassian; evolution of Triassic and Jurassic echinoids.

VALENTINE, JOE - studying the interaction between a local sea urchin species and a recently introduced macroalga in subtidal waters (for PhD at the University of Tasmania).

VALENTINE, JOHN - continuing investigations of sea urchin herbivory and predation on sea urchins in the Florida Keys.

VAN DER HAM, RAYMOND W.J.M. - *Hemiaster* and *Echinogalerus* of the Upper Cretaceous of NW Europe.

VAN HOUT, TESSA - distribution of *Echinothrix diadema* in Kenyan reefs.

VANDENSPIEGEL, DIDIER - the defensive mechanism of the Echinodermata: structure and functions of the Cuvierian tubules.

VEGA, JUAN TORRES - study of the echinoids and ophiuroids collected on the Campanas Oceanograficas Proibe I-II-III-IV-V.

VELARDE, RONALD G. - benthic infauna and trawl invertebrates of the Southern California Bight, taxonomy and distributional ecology (in conjunction with other monitoring agencies in southern California).

VIADA, STEPHEN T. - Characterization study of the 'pinnacles' topographic features in the north central Gulf of Mexico.

VIKTOROVSKAYA, GALINA I. - reproduction of invertebrates in artificial and natural conditions.

VILLIER, LOIC - Radiation of the genus *Heteraster* (Lower Cretaceous Spatangoida); taxonomy, phylogeny and disparity (for Ph.D. dissertation). Also, taxonomic and phylogenetic revision of the family Stauranderasteridae (fossil Asteroidea).

VISTISEN, BODIL K. - studying the two brittle stars *Ophiura albida* and *Amphiura filiformis* concerning their tolerance towards hypoxia with and without the presence of hydrogen sulphide.

WAREN, ANDERS H. - gastropods parasitic on echinoderms.

WASSON, KRISTINA - reproduction and factors that control reproduction in echinoids.

WATTS, STEPHEN A. - Steroid biology in echinoderms; aquaculture of echinoids.

WEBSTER, GARY D. - Carboniferous and Permian crinoids of Australia - with Peter Jell; Early Carboniferous crinoid faunas of the western U.S.

WELSCH, ULRICH - innervation of the juxtaligamental cells in crinoids; analysis of the connective tissue of crinoids.

WHITE, CHRIS - crinoids.

WIDDISON, ROSANNE - Ph.D. dissertation (started 10/97) entitled, Palaeobiology of Silurian crinoids. Involves a complete taxonomic review of UK Silurian collections and establishment of crinoid communities in UK. Also looks at the variations in US and UK faunas.

WIGHAM, BEN - Reproductive biology, ecology and population genetics of Elapodid holothurians from the NE Atlantic; influence of seasonal phytodetrital fluxes on changes in the structure of abyssal megafauna communities (for Ph.D. dissertation).

WILKIE, IAIN C. - functional morphology and mechanics of the echinoid lantern; functional morphology and mechanics of the ophiuroid mouth-frame; organisation, mechanics and physiology of echinoderm connective tissues; autotomy mechanisms of echinoderms and other invertebrates.

WILLCOX, MARK S. - molecular phylogeny of asteroids; genetic basis to salinity adaptation in asteroids.

WILLIAMSON, JANE E. - An autogenic shift in the response of the echinoid, *Holopneustes purpurascens*, to host plant chemistry (current Ph.D. at the University of New South Wales). Intense grazing by the sea urchin *Heliocidaris erythrogramma* on algal community structure (group project).

WIRTZ, PETER - Part of my ongoing effort to photograph and list all larger invertebrates of the area Azores, Madeira, Canaries. See my book Wirtz, Peter (1994) Underwater guide Madeira, Canary Islands Azores - Invertebrates. Nagelschmid Verlag Stuttgart, 247 pages. These data (e.g. the findings of many supposed Mediterranean "endemics") are then worked up in zoogeographic analyses such as P. Wirtz/ H. Martins (1993) New and little known marine invertebrates from the Azores - with a discussion of the zoogeography of the area. Archipelago 11 A, 55-63 and the 1998 paper mentioned above.

WORHEIDE, GERT - actuopaleontology and ecology of *Astrosclera willeyana* Lister 1900 (Demospongiae) (for Ph.D. thesis); taphonomy of coral reef echinoids.

WRAY, GREGORY A. - evolution of body-patterning genes in echinoderms; evolution of echinoderm larvae; phylogeny of echinoids.

YAMAGUCHI, MASASHI - supervising a thesis on *Acanthaster planci*.

YANAGISAWA, TOMIO - larval development from plutei to metamorphosis of the sea urchins in the Ogasawara (Bonin) Islands.

YOKOTA, YUKIO - extracellular matrix and morphogenesis in the sea urchin; phylogenic analysis of yolk proteins in sea urchins and starfishes; functions of vitellogenin and vitellogen in the sea urchin and starfish.

YOSHIZATO, KATSUTOSHI - molecular evolution of invertebrate collagen.

YUND, PHIL - fertilization processes, gamete toxicology, and the genetic differentiation of populations of *Strongylocentrotus drobachiensis*.

ZAVODNIK, DUSAN V. - Echinoderms in the menaced and protected areas of the Adriatic Sea; Echinoderm distributional patterns.

ZITT, JIRI - Lower Cretaceous crinoids of West Carpathians; crinoids and echinoids of the Bohemian Cretaceous Basin (late Cenomanian- early Turonian).



☆☆☆ PAPERS PRESENTED AT MEETINGS ☆☆☆

(By country or region)

ALGERIA

Mezali, K. Bimetric relations of five aspidochirotid holothurians (HOLOTHUROIDEA : ECHINODERMATA) of the Sidi-Frdj region - Algeria. **First North African Maghrebin Seminary of the Sea Sciences at Hammamet, Tunisia, 20-23 of November 1995.**

Mezali, K. On the presence in the gulf of Skikda (east of Algeria) of the apodid holothurian *Labidoplax digitata* (HOLOTHUROIDEA : ECHINODERMATA). Abstract published. **The Second Tunisians Days of Marines Sciences (ATSM/ INSTM Centre of Monastir- Tunisia), 16-18 December 1996.**

Mezali, K. Length structure of fives aspidochirotid holothurians (HOLOTHUROIDEA :ECHINODERMATA). Abstract Published. **The Second Tunisians Days of Marines Sciences (ATSM/ INSTM Centre of Monastir- Tunisia), 16-18 December 1996.**

Mezali, K. Modal's analysis and trial of the estimation of the growth parameters of five Algerian sea cucumbers species. Abstract published. **The Second Tunisians Days of Marines Sciences (ATSM/ INSTM Centre of Monastir- Tunisia), 16-18 December 1996.**

Mezali, K. Analyse modale et essai d'estimation des paramhtres de croissance et de l'bge de trois esphces d'holothuries aspidochirotes (HOLOTHUROIDEA : ECHINODERMATA) de la rigion de Sidi-Fredj (Algerie). **35th Symposium of the International Commission of Scientific Exploration of Mediterranean Sea. Dubrovnik, Croatia, 1-5 June 1998.**

Mezali, K. Abundance, dispersion and microdistribution of aspidochirotid holothurians (HOLOTHUROIDEA : ECHINODERMATA) in the *Posidonia oceanica* meadow of the Sidi - Fredj peninsula (Algeria). **International Seminary of Environmental, Development and Protection of Coastal Areas, 1-2 June 1998. " Palais des Nations "- Algiers- Algeria.**

Mezali, K. Length structure of five aspidochirotid holothurian species (HOLOTHUROIDEA : ECHINODERMATA) inhabiting the *Posidonia oceanica* meadow of the sidi-fredj region (Algeria). Abstract published. **The First Scientific Days of Environment and Biodiversity. North African Society of Life History. February 1997- " Palais de Culture "- Algiers- Algeria.**

Mezali, K. On the presence in the gulf of Skikda (East of Algeria) of the apodid holothurian *Labidoplax digitata* Montagu (HOLOTHUROIDEA : ECHINODERMATA) : Description and preliminary note. Abstract published. **Participation to the First National Days of the Marines Sciences Studies. J'NESMA. May 1997. Navy Commandment Forces- Tamentefoust- Algeria.**

Mezali, K. Modals analysis and trial of the estimation of the growth parameters, the age of three aspidochirotids holothurians species (HOLOTHUROIDEA : ECHINODERMATA)". Abstract published. **Participation to the First National Days of the Marines Sciences Studies. J'NESMA. May 1997. Navy Commandment Forces- Tamentefoust- Algeria.**

Mezali, K. Chemical and granulometrics analysis of the guts contains of one aspidochirotid holothurian species *Holothuria polii* (HOLOTHUROIDEA : ECHINODERMATA) and the bottom sediment of the Tamentefoust area (Algeria). Abstract published. **The Second National Days of the Marines Sciences Studies. J'NESMA. May 1998. Navy Commandment Forces- Tamentefoust- Algeria. 1998 : the World Day of the Ocean.**

## AUSTRALIA

Uthicke, S., and J.A.H. Benzie. Allozyme variation as a tool to measure asexual reproduction in echinoderms. **Genetic Society of Australia, Brisbane, July 1999.**

Uthicke, S., J.A.H. Benzie, and E. Ballment. Population genetics of tropical sea cucumbers. **Australian Marine Science Association Annual Scientific Conference, Adelaide, Australia, 8-11 July 1998.**

## EUROPE

Agueli, C., F. Geraci, F. Palla, G. Spinelli, G. Giudice, D. Cascino, and G. Sconzo. Ruolo essenziale dell'hsp70 costitutiva nelle mitosi dei primi stadi di sviluppo di *P. lividus*. **Atti Congresso Nazionale Associazione di Biologia Cellulare e del Differenziamento (1998) 203. Montesilvano Lido (PE).**

Agueli, C., F. Geraci., G. Giudice, D. Cascino, and G. Sconzo. Constitutive hsp70 and cdc2 are located in the centrosomal structures during early cleavage of *P. lividus* embryos. **European Congress of Cell Biology. ECBO. (1999) p.94. Bologna.**

Bohn J., T. Heinzeller, and A.V. Smirnov. "Comparison of the Bourgueticrinid and Isocrinid aboral nervous system, possible phylogenetic implication". **Fifth European Conference on Echinoderms 7-12 September 1998, Milan, Italy.**

David, J., M. Roux, N. Ameziane, C.G. Messing, and T.K. Baumiller. 1998. Discontinuités taxonomiques ou gradients écologiques et ontogénétiques dans l'évaluation de la diversification. L'exemple des pentacrines. **Réunion annuelle des Sciences de la Terre, Brest, 31 March- 4 April 1998. Résumés. P. 98-99.**

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☆☆☆☆☆ PAPERS PRESENTED AT MEETINGS ☆☆☆☆☆

(By conference)

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Donovan, S.K. Evolution of Caribbean echinoderms during the Cenozoic: moving towards a complete picture using all of the fossils.

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Adams, N.L. UV radiation affects development but not gametogenesis of green sea urchins. 160A

Amsler, C.D., J.B. McClintock, & B.J. Baker. Chemical defense, physical defense and mutualism in Antarctic macroalgae, urchins, and anemones. 163A

Blake, D.B. Morphological perspectives on asteroid phylogeny. 2A

Boettger, S.A., & J.B. McClintock. Bacterial clearance rates in the sea urchin *Lytechinus variegatus* exposed to inorganic and organic phosphates. 46A

Bolton, T.F., F.I.M. Thomas, & C.N. Leonard. Energetic content of eggs and egg extracellular layers of the echinoid *Arbacia punctulata*. 185A

Bosch, I., & D. Karentz. Effects of UVB exposure on the early development of Antarctic invertebrates during springtime depletion of stratospheric ozone. 162A

- Christensen, A.B. Properties of the hemoglobins of the brittlestar, *Ophiactis simplex* (Echinodermata, Ophiuroidea) 120A
- Dean, J. Origin and evolutionary diversification of the earliest asteroids. 3A
- Farley, G.S., & D.R. Levitan. Bigger is better: the importance of egg 'target' size to sperm-egg collisions in the sea urchin *Lytechinus variegatus*. 185A
- Flowers, J.M., & D.W. Foltz. Unraveling the taxonomy of a cryptic sea star complex (*Leptasterias* spp.) with museum DNA. 56A
- Foltz, D.W., A.W. Hrnicevich, & J.M. Flowers. Molecular and morphological approaches to the taxonomy of a speciose clade of sea stars (*Leptasterias* sugenus *Hexasterias*). 4A
- Hart, M.W. Speciation, paraphyly, and higher taxa. 4A
- Hendler, G., & L.U. Tran. Direct development of a deep-sea brittlestar (Echinodermata: Ophiuroidea) 136A
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- Hottenrott, S. A phylogenetic analysis of the Ophiolepididae (Echinodermata: Ophiuroidea) with an evaluation of the origin of its deep sea members. 97A
- Janies, D.A. Phylogeny and the evolution of development among asteroids. 3A
- Knott, K.E. Controversy and consensus in asteroid systematics: new insights into ordinal and familial relationships. Evolution of Starfishes: Morphology, Molecules, Development and Paleobiology Symposium.
- Levitan, D.R. Reproductive isolation and hybridization among co-occurring *Strongylocentrotus* sea urchins. 185A
- Mah, C.L. Forcipulatacean phylogenetics: a beginning. 3A
- McEdward, L.R. Simulation models of reproductive strategies: fitness differences under fluctuating environmental conditions. 181A
- McGinn, M.P. Lesser, & C.W. Walker. The influence of estradiol on vitellogenesis in the green sea urchin *Strongylocentrotus droebachiensis*. 22A
- Mooi, R., & B. David. Armed conflict: what a new theory of skeletal homologies tells us about stelleroid evolution. 2A
- Morgan, K.H., & L.R. McEdward. Interspecific relationships between egg size and energy content in echinoderms. 185A



Stanko, J.P., S.P. Greer, J.B. McClintock, & C.D. Amsler. Antifouling activity of ophiuroid body-wall extracts. 55A

Thomas, F.I.M., T. Bolton, & C.N. Leonard. Surviving shear stress in the gonopore during spawning: the role of echinoderm egg jelly coats. 182A

Vickery, M.S. & J.B. McClintock. The comparative morphology of tube feet among the Asteroidea: phylogenetic implications. 3A

Vickery, M.C.L., M.S. Vickery, J.B. McClintock, & C.D. Amsler. Isolating regenerative genes in echinoderm larvae. 28A

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Arakaki, Y., and T. Euhara. Comparative studies among black *Echinometra* from Indo-Pacific and the type specimen of *Echinometra oblonga*. 39.

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- Hongo, T., K. Matoba, K. Kiritaka, H. Nakajima, T. Shimizu, and S. Idegami. Phosphorylation of NAAP, a nucleolar protein, during starfish oocyte maturation. 65.
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- Inoue, M., R. Birenheide, and T. Motokawa. Distribution and localization of NGIWY-amide in the sea cucumber, *Apostichopus japonicus*. 120.
- Kadota, J., Y. Nakajima, M. Dan-Sohkawa, and H. Kaneko. Intracellular localization and biochemical nature of a molecule specific to embryonic mesenchyme cells of the starfish, *Asterina pectinifera*. 71.
- Kamata, Y., A. Fujiwara, M. Takeuchi, and I. Yasumasu. Adenosine-caused inhibition of pluteus arm formation and gut formation in sea urchin embryos. 59.
- Kamagata, N., Y. Nagumo, and I. Yazaki. Opening of the mouth and differentiation of the archenteron in the sea urchin larvae. 80.
- Kamiyama, T., T. Goto, and S. Ishida. Lithium induces fusion embryos in marine planaria polyclad and starfish. 79.
- Katow, H. Occurrence of pamlin-associated tyrosine phosphorylation of a protein plays an important role during early embryogenesis in sea urchin embryo. 88.
- Kawamura, M., K. Chiba, M. Matsumoto, and M. Hoshi. Characterization of the sperm receptor for acrosome reaction-inducing substance (ARIS) in the starfish, *Asterias amurensis*. 79.
- Kazama, M., and A. Hino. Inhibitions of the electron transport chain at the ascidian sperm reaction-like morphological changes in sea urchin sperm. 63.
- Kiritaka, K., H. Sugino, Y. Hamguchi, K. Okano, and S. Ikegami. Topogenesis of NAAP, a nucleolar protein in the starfish oocyte. 65.
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- Kominami, T. Establishment of pigment cell lineage in embryos of the sea urchin, *Hemicentrotus pulcherrimus*. 84.
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- Mishiro, T., and A. Matsuno. A study on catch mechanism of the connective tissue of sea cucumber. II. 31.
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- Nakashima, S., and K.H. Kato. Ultrastructural studies on the behavior of centrioles during meiosis of sea urchin oocytes. 74.
- Nishigori, H., and S. Amemiya. Left-right asymmetry in distribution of small micromere derivatives between coelomic pouches of sea urchin embryos. 76.
- Nozaki, H., Y. Kamata, A. Fujiwara, and I. Yasumasu. Effects of embryo extract on expansion of exogut isolated from vegetalized embryo of sea urchin. 58.
- Nunomura, K., K. Nakamura, N. Yokoyama, K. Okano, T. Shimizu, and S. Ikegami. Formation of histone heterodimers in starfish sperm nuclei and their disappearance from the male pronucleus. 64.
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- Ohta, E., S. Ohta, and S. Ikegami. Specific inhibition by kalinholin F of the first mitosis of the starfish embryo. 65.
- Ohtsu, C., M. Takayama, Y. Mogami, and S.A. Baba. High speed video analysis of beat period fluctuation in sea-urchin embryo cilia. 113.
- Okano, K., T. Kitajima, H. Mizoguchi, and A. Hino. Abnormal morphogenesis of sea urchin embryo treated with norepinephrine – analysis of spicule formation by cell culture. 63.
- Okano-U, T., M. Iwashita, K. Tachibana, and T. Kishimoto. CDC25 and WEE1 are under distinct regulation during meiotic and early cleavage cycles in starfish. 65.
- Omori, R., K. Kaji, and S. Amemiya. Distribution of small micromere derivatives between left-right

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Shirai, H., and Y. Kuroiwa. Surplus energy in starfish eggs and its function. 37.

Shirai, H., K. Seno, M. Okada, Z. Ikeda, and T. Fukuda. Induction of oocyte maturation by GSS in ovarian oocytes, and a large scale culture of juveniles of the sea cucumber, *Stichopus japonica*. 47.

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Suzuki, K., Y. Satoh, T. Kusakabae, and N. Suzuki. Structural analysis of sperm-activating peptide receptors - guanylyl cyclase diversity. 51.

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Tsuchi, A., and T. Motokawa. Dynamic mechanical properties of holothurian dermis. 90.

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Yamamoto, N., M. Komatsu, Y. Yokota. A major yolk protein of the starfish, *Asterias amurensis*. 61.

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Yoshimura, M., and C. Shingyoji. Modulation of microtubule sliding velocity by central pair tubules in sea urchin sperm flagella. 95.



**Papers presented at the XIX Congreso de Ciencias del Mar, Antofagasta, Chile. 3-7 May 1999.**

Contributed by J.M. Lawrence

Olave, S., E. Bustos, P. Cárcamo, and J. Lawrence. Efecto de la alimentación artificial sobre el rendimiento gonádico del erizo *Loxechinus albus* (Molina 1782) en distintos rangos de tamaño.

McBride, S.C., J.M. Lawrence, A.L. Lawrence, and T. Mulligan. Ingestion, absorption and gonad production of the sea urchin *Strongylocentrotus franciscanus* fed different ratios of a prepared diet.

- Hill, S.K., and J. Lawrence. Microhabitats of the co-occurring sea-urchins *Lytechinus variegatus* and *Arbacia punctulata* on the Florida Gulf shelf.
- Mutschke, E., and C. Ríos. Estudio taxonomico y distribucional de los echinodermos presentes en el Estrecho de Magallanes, Chile.
- George, S., J.M. Lawrence, and A.L. Lawrence. Utilization of a prepared feed for egg production in the sea urchin *Lytechinus variegatus*.
- Olave, S., P. Cárcano, E. Bustos, and J. Lawrence. Alimentación artificial del erizo *Loxechinus albus* (Molina, 1782), bajo condiciones de cultivo durante un ciclo anual.
- Zuñiga, M., C. Espinosa, and F. Vargas. Evaluación de la toxicidad de la interfase agua-sedimento de Bahía Caldera, III Región, mediante bioensayos con organismos marinos. (Sea urchins)
- Ruiz, P., C. Espinoza, and M. Zúñiga. Efectos tóxicos de metales sobre la fertilización y desarrollo larval del erizo de mar, *Arbacia spatuligera*.
- Soto, D., F. Jara, C. Molinet, and M. Vargas. Bases ecológicas para la evaluación del estado de algunos recursos bentónicos en la XI región: el valor de la interacción "pescador-bancos naturales". (sea urchins)
- Mutschke, E., C. Ríos, I. Cañete, and A. Mansilla. Ensamble macrofaunístico asociado a discos de fijación de *Macrocystis pyrifera* (L.) C. Agardh colectados en el Estrecho de Magallanes, Chile.
- Figuerola, M., Y. Donoso, R. Aranguéz, and H. Pérez. Experiencias preliminares de incorporación al ambiente natural de juveniles del erizo rojo *Loxechinus albus*, producidos en laboratorio, en el sector de Quintay (V Región).



**Evolution '99, a joint meeting of the Society for the Study of Evolution, The American Society of Naturalists and the Society of Systematic Biologists. University of Wisconsin, Madison, WI June 22-26, 1999.**

Contributed by Susan Hottenrott

Kerr, A.M. Evolution and systematics of the Holothuroidea (Echinodermata). oral

Hottenrott, S.I. A phylogenetic analysis of the Ophiolepididae (Echinodermata Ophiuroidea) with an evaluation of the origin of its deep-sea members. poster

McGovern, T.M. Sex ratio bias and gender-specific clonal structure in the brittle star *Ophiactis savignyi*. poster



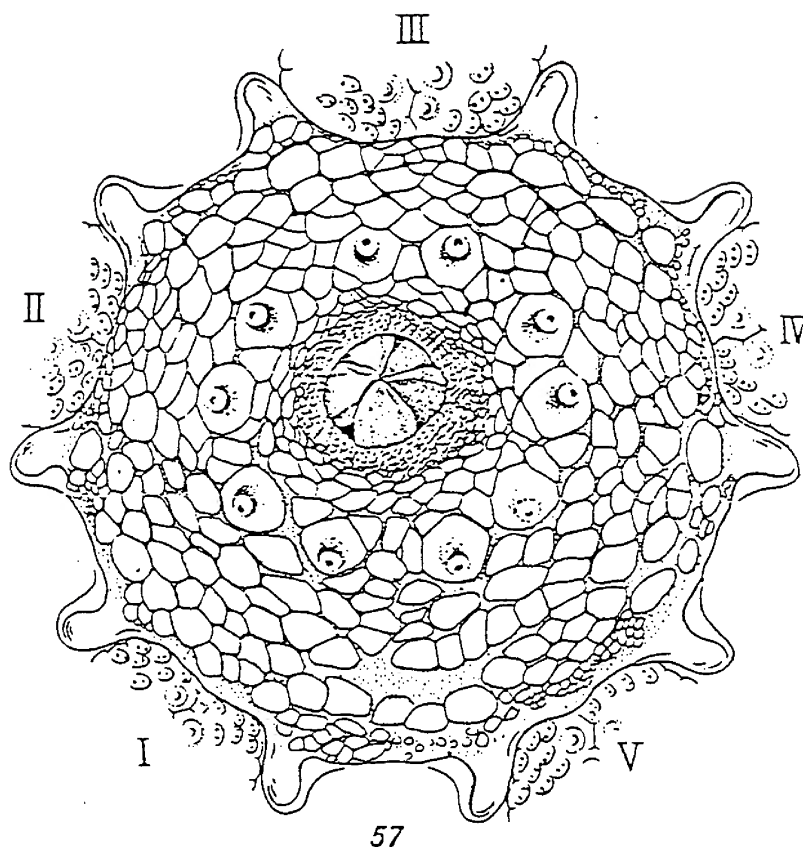
# FIFTH FLORIDA ECHINODERM FESTIVAL

UNIVERSITY OF SOUTH FLORIDA

20 FEBRUARY 1999

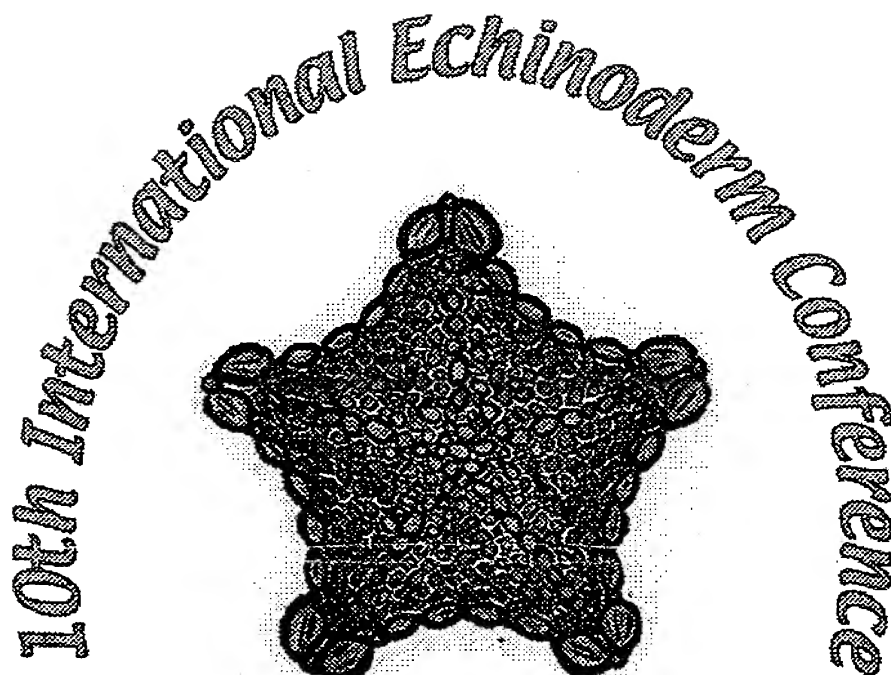
## Participating Institutions

Eckerd College  
Florida Institute of Technology  
Georgia Southern University  
Jacksonville University  
Nova University  
University of Florida  
University of Miami  
University of South Florida



*Toxopneustes variegatus* (Lamarck). Tampa Bay, Florida.

Jackson, R.T. 1912. Phylogeny of the Echini



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29 January to 4<sup>th</sup> February, 2000

Dunedin, New Zealand

This conference will be held on the main campus of the University of Otago, in the city of Dunedin, New Zealand.

**Pre-register now using this form.**

**Communication of information about the conference**

Details on many aspects of the conference, e.g registration costs, have still to be determined and these www pages will be regularly updated as this information becomes available. This web site will be the source of most conference information, and much of the communication with participants will be done through the web and by e-mail rather than by regular mail. We would prefer that you use web forms to send information on registration, bookings of pre and postconference trips etc when these are requested later in the year.

**Local organising committee:**

Dr Mike Barker (Chair)

Professor Philip Mladenov

Dr Brian Stewart

Dr Stephen Wing

☆☆☆☆ THESES AND DISSERTATIONS ☆☆☆☆

ALGERIA

**Degree of Magister**

Karim Mezali. 1998. Contribution to the systematic, the biology, the ecology and the dynamics of five aspidochirotid holothurians (HOLOTHUROIDEA: ECHINODERMATA) inhabiting the *Posidonia oceanica* meadow of the Sidi-Fredj peninsula - Algeria. National Institute of Sea Sciences and Coastal Planning (N.I.S.S.C.P.).

**Ph.D. Dissertation**

Karim Mezali. 1998-1999. (In progress). Caryology, ecological and ethological observations, life cycle and the impact of feeding behavior of five aspidochirotids holothurians species (HOLOTHUROIDEA: ECHINODERMATA) on the *Posidonia oceanica* ecosystems located in two Algerians adjacent areas : primary data.

BELGIUM

**Ph.D. Dissertation**

Christine Spirlet. Biologie de l'oursin comestible (*Paracentrotus lividus*) : controle du cycle reproducteur et optimisation de la phase de remplissage gonadique. Université Libre de Bruxelles. July 2, 1999.

**Masters Thesis**

Yannick Dewael. 1998. Implications of seconds messengers in the luminous control of *Amphipholis squamata* (Delle Chiaje, 1828) (Echinodermata) luminescence. Catholic University of Louvain.

BRAZIL

**Ph.D. Dissertation**

C.R.R. Ventura. 1997. Biologia de *Astropecten brasiliensis* Müller e Troschel, 1842 e *Astropecten cingulatus* Sladen, 1889 (Echinodermata: Asteroidea) na Região de Cabo Frio, RJ. Universidade de São Paulo.

A. de O. R. Junqueira. 1998. Biologia populacional de *Lytechinus variegatus* (Lamarck, 1816) em habitats contrastantes do litoral do Rio de Janeiro, Brasil. Universidade de São Paulo.

Valeria F. Hadel. 1997. Reprodução e comportamento de *Chiridota rotifera* (Echinodermata, Holothuroidea) em laboratório [Reproduction and behavior of *Chiridota rotifera* (Echinodermata, Holothuroidea) in laboratory]. 190 p. - University of São Paulo (in Portuguese).

M.N. Albuquerque. 1986. Ophiuroidea (Gray 1840) (Echinodermata) da plataforma continental do norte e nordeste da Brasil. Universidade de São Paulo.

A.M.G. Monteiro. 1987. Ophiuroidea (Echinodermata) da região de Ubatuba (São Paulo): aspectos morfológicos e ecológicos. Universidade de São Paulo.

Claudio G. Tiago. 1998. Dendrochirotida (Echinodermata: Holothuroidea) no Canal de São Sebastião. [Dendrochirotida (Echinodermata: Holothuroidea) on the São Sebastião Channel]. 136 p. University of São Paulo (in Portuguese).

### **Masters of Science Thesis**

F. Giordano. 1986. Ouriços do sublitoral rochoso da região de São Sebastião - São Paulo: uma abordagem e ecologia. Universidade Estadual de Campinas.

## **CZECH REPUBLIC**

### **Ph.D. Dissertation**

R. Štorc. (in progress). Ophiuroidea from the Upper Cretaceous of the Bohemian Cretaceous Basin (Czech Republic). Charles University, Praha.

## **FRANCE**

### **PhD Dissertation**

Céline Madon-Senez. Disparité Morphologique et Architecturale des Schizasteridae incubants (Echinoidea, Spatangoida) des Régions Australes. Université de Bourgogne, 1998. 261pp + 18 pls.

Mourad Guettaf. Contribution à l'étude de la variabilité du cycle reproductif (indice gonadique et histologie des gonades) chez *Paracentrotus lividus* (Echinodermata: Echinoidea) en

Méditerranée Sud Occidentale (Algérie). Université de la Méditerranée, Aix-Marseille II (Faculté des Sciences de Luminy), 1997.

Gustavo A. San Martin. Contribution a la gestion des stocks d'oursins: Etude des populations et transplantations de *Paracentrotus lividus* a Marseille (France, Méditerranée) et production de *Loxechinus albus* a Chiloe (Chili, Pacifique). Université de la Méditerranée, Aix-Marseille II (Faculté des Sciences de Luminy), 23 June 1995.

### **Degree : DEA**

Thomas Saucedo. Fluctuating Asymmetry in the Spatangoid sea urchins *Echinocardium cordatum* and *Echinocardium flavescens*. Université de Bourgogne, June 30 1998.

## **GERMANY**

### **Ph.D. Dissertation**

Christian Neumann. 1999. Diversitäts- und Häufigkeitsmuster kalkiger Dinoflagellaten - Zysten aus dem Alb Nordwest-Deutschlands. (Paleoecology of Cretaceous calcareous dinoflagellates). Institut für Palaontologie der Freien Universität Berlin.

Sven Uthicke. 1998. Population structure of *Holothuria* (*Halodeima*) *atra* (Jaeger, 1833) and *Stichopus chloronotus* (Brandt, 1835) (Holothuroidea: Aspidochirotrida) and their role in nutrient recycling in coral reef ecosystems. University of Hamburg.

## **HONG KONG**

### **Ph.D. Dissertation**

Xing Jun. 1996. Sea Cucumber Immunology. Hong Kong University Science and Technology.

## **INDIA**

### **Master of Science (Marine Biology and Oceanography)**

K.P. Manikandan. 1995.

i) Analysis of Heavy metal concentrations in different tissues (Gills, Hepatopancreas, muscle



tissue) in *Scylla tranquebarica* (Mud crab). Centre for Advanced Study in Marine Biology, Portonovo, Annamalai University.

ii) Comparative analysis of the toxic effect of trivalent and hexavalent chromium ions in the respiratory activity of *Scylla tranquebarica*. Centre for Advanced Study in Marine Biology, Portonovo, Annamalai University.

## **IRELAND**

### **Ph.D. Dissertation**

Amy Greenwood. (In progress) . The reproductive ecology of asteroids in Lough Hyne, Ireland. commenced 1997. National University of Ireland, Cork.

## **JAPAN**

### **Master of Science**

Chisato Murakami. 1999. Development of the Antarctic sea star, *Psilaster charcoti*, belonging to the family Astropectinidae (Echinodermata, Asteroidea), with phylogenetic considerations. Toyama University, Toyama, Japan.

## **NEW ZEALAND**

### **Master of Science**

Nicola Alcock. Reproduction and aspects of ecology of *Ocnus brevidentis* (Hutton, 1872) in Southern New Zealand. University of Otago, March 1999.

## **PAKISTAN**

### **Ph.D. Dissertation**

Qaseem Tahera. (in progress). Systematics, reproduction and larval distribution of holothuroids and echinoids inhabiting the Arabian Sea. University of Karachi, Karachi, Pakistan.

## RUSSIA

### Ph.D. Dissertation

Eliseikina M.G. Morphofunctional states and physiological regeneration of digestive tract lining epithelium in *Cucumaria japonica*. Institute of Marine Biology, Vladivostok, Russia.

## UNITED STATES

### Master of Science

T.W. Foret. 1999. Subcuticular bacteria in Florida echinoderms: Incidence of occurrence and variation in symbiont densities over time and space. Univ. South Florida, Tampa.

C.-Y. Tan. 1999. Variability in characteristics of populations of the sand dollar *Mellita tenuis* Clark over space and time. Univ. South Florida, Tampa.

Stephen Viada. 1980. Species composition and population levels of scleractinian corals on the East Flower Garden Banks, NW Gulf of Mexico. Texas A&M University.

Michael Devin. 1998. A laser-based method to quantify the species diversity of the deep-sea benthic megafauna. Florida Institute of Technology (advisor Dr. Craig Young).

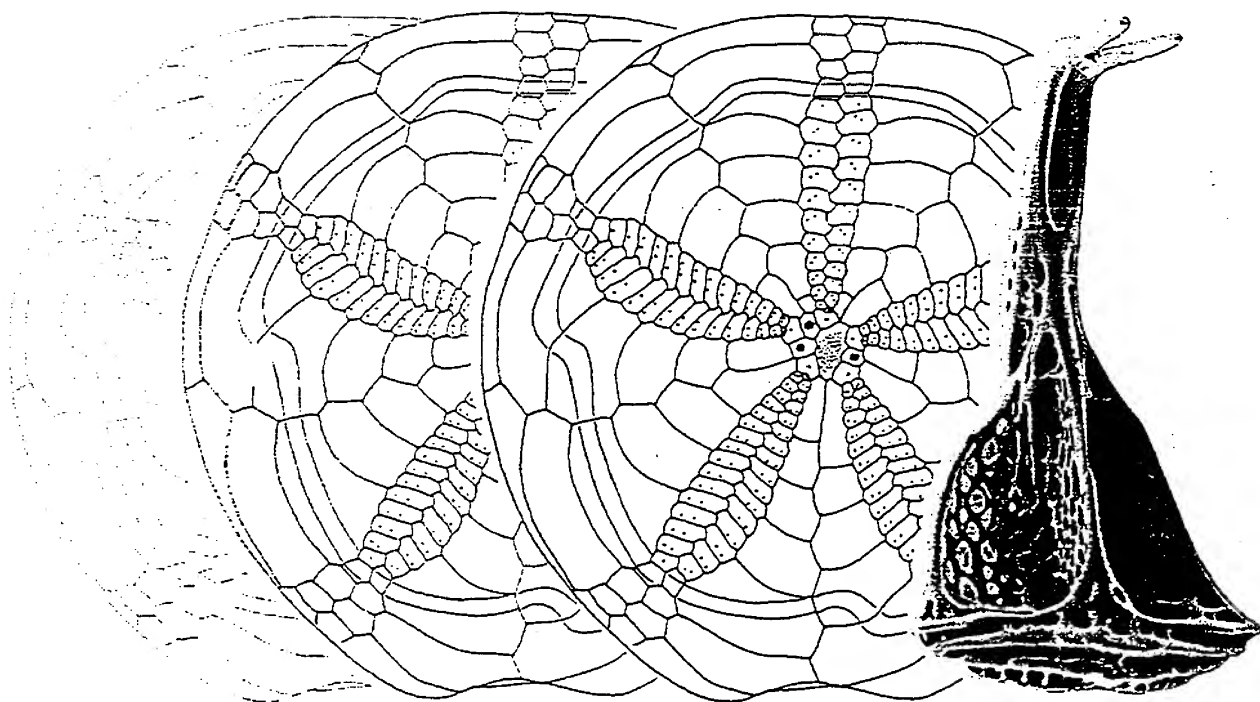
### Ph.D. Dissertation

Kristina M. Wasson. 1999. Reproduction and Sex Steroids in *Lytechinus variegatus* (Lamarck) (Echinodermata: Echinoidea). University of Alabama at Birmingham.

Kirsten C. Sadler. 1998. Components of the signaling pathway leading to cell cycle activation and meiotic maturation of starfish oocytes. Harvard University, Division of Medical Sciences, Cambridge, MA (Ph.D. in Cell Biology).

**DISPARITÉ MORPHOLOGIQUE ET ARCHITECTURALE  
DES SCHIZASTERIDAE INCUBANTS  
(ECHINOIDEA, SPATANGOIDA)  
DES RÉGIONS AUSTRALES**

**CÉLINE MADON-SENEZ**



*Thèse de Doctorat*

**1998**

☆☆☆☆☆ ANNOUNCEMENTS ☆☆☆☆☆

D.B. James - Conducted Training Programme in Farming of Sea Cucumbers at Kavaratti Island (Lakshadweep) Laccadives during March 1999.

D.J. James - Received a Special Award from Fisheries Technocrats Forum, Madras for outstanding contribution in Fisheries Science.

☆☆☆ ADVANCE NOTICE ☆☆☆

From John Gage

There is a consortium of 22 oil/gas companies (called AFEN - the Atlantic Frontier Environmental Network) who are awarding some modest bursaries to help identify NE Atlantic margin echinoderms. Much of the material in question has been collected in the course of statutory environmental assessment that is required of companies before they start operations in deep water. This is presently mainly off Scotland, but probably in the future will include neighbouring maritime states opening up to hydrocarbon prospecting such as Ireland. A great deal of material exists already, and more can be expected. This will be the second round, the first opportunity (advertised in the New Scientist at the beginning of May 1999) being now closed. However, as no echinoderm specialists applied then, there should be good opportunities for echinoderms people in the future, probably next year.

☆☆☆☆☆ CONFERENCE ANNOUNCEMENTS ☆☆☆☆☆

Mike Reich, (University of Greifswald, Germany)

Organizer of the "1st Meeting of German speaking echinoderm researcher" in 2000 or 2001. Please contact:

Mike Reich  
Institute Geological Sciences  
University Greifswald  
Greifswald, Mecklenburg-Vorpommern  
D-17489 Germany  
p- +49 (0)3834-86-4552; f- +49 (0)3834-86-4572  
reichmi@mail.uni-greifswald.de



Stephen Watts - Plans are under way for a **“Biology of Echinoids” symposium** at the **Society for Integrative and Comparative Biology (2001, Chicago Meeting)**.

The symposium will focus on issues of echinoid biology, particularly as they relate to recent fisheries and aquaculture efforts. The symposium will provide information on basic and applied aspects of urchin life history and husbandry. The symposium will be of interest to any echinoid biologist, and symposium contributors and other contributed papers will be solicited in the near future.

**Please contact:**

Stephen A. Watts  
University of Alabama at Birmingham  
Dept Biology, Campbell Hall  
1300 University Blvd  
Birmingham, AL 35294-1170  
p- 205-934-8308; f- 205-975-6097  
[sawatts@uab.edu](mailto:sawatts@uab.edu)



**9th International Congress on Invertebrate Reproduction and Development.**

**July 2001**

**Rhodes University, Grahamstown, South Africa**

**Conference Organiser:** Alan Hodgson,  
Department of Zoology & Entomology  
Rhodes University, Grahamstown 6140, South Africa  
e-mail: [zoah@giraffe.ru.ac.za](mailto:zoah@giraffe.ru.ac.za); Fax: +46 622 4377.

The first announcement and preliminary details are available at:  
**<http://www.rhodes.ac.za/conferences/icird2001>**

Professor Alan Hodgson  
Dept. Zoology & Entomology  
Rhodes University  
Grahamstown 6140  
South Africa  
Tel. (+46) 6038526 Fax (+46) 6224377



## ☆☆☆☆☆ REQUESTS AND SUGGESTIONS ☆☆☆☆☆

Asha, P.S. - requests reprints on echinoderms nutrition, ecology and culture methods. Please respond to:  
Payikat Asha, TRC of CMFRI, South Beach Road Extension, Karappad, Tuticorin, Tamil Nadu,  
628001 India. p- 0461-320102; f- 0461-30198.

Brey, T. ([tbrey@awi-bremerhaven.de](mailto:tbrey@awi-bremerhaven.de))

I am building a data bank on aquatic invertebrate respiration, and echinoderms should play a significant role here. Hence, any data, especially from the grey literature, on respiration of echinoderms (data format: species, body mass, respiration, temperature) are welcome.

Donovan, S.K. - would like to obtain one or a few specimens of *Lytechinus callipeplus* H.L. Clark, 1912, from the tropical western Atlantic, in order to examine their spine morphology by SEM.  
[stephen.donovan@nhm.ac.uk](mailto:stephen.donovan@nhm.ac.uk) or [sted@nhm.ac.uk](mailto:sted@nhm.ac.uk)

Evdokimov, V.V. - would like to exchange publications with colleagues. [root@tinro.marine.su](mailto:root@tinro.marine.su)

Greenwood, A. - requests contact with anyone looking at parentage in self-fertilising invertebrates, especially using RAPD. [A.Greenwood@ucc.ie](mailto:A.Greenwood@ucc.ie)

Greenwood, A. - Anyone who needs a fully trained and experienced diving research assistant from summer 2000 on please contact me! [A.Greenwood@ucc.ie](mailto:A.Greenwood@ucc.ie)

Hottenrott, S. - I am interested in obtaining specimens from recently caught Ophiopodids (e.g., *Ophiopoda*, *Ophiomusium*, *Ophiopoda*) known to have been preserved only in alcohol for molecular analysis and sequencing. I am also interested in specimens of the rarer genera, in any state of preservation, such as *Ophiopoda* (from the South Pacific and New Zealand), *Ophiopoda* (from cold temperate regions), *Ophiopoda* (especially *Ophiopoda januarii*, *declinans* and cold water forms) and the extremely rare *Ophiopoda* and *Ophiopoda nodosa* (from the Great Barrier Reef). I would be very interested to know if there is anyone sequencing ophiopods (preferably complete sequences) for 18S and 28S in addition to what is in GenBank. I can be reached at [sih@gwu.edu](mailto:sih@gwu.edu)

Jesus, D. - I would appreciate literature (systematic and taxonomic) on the genus *Schizaster* (Echinoidea) living Mediterranean Sea and Atlantic Ocean. Please contact: [doraj@mail.telepac.pt](mailto:doraj@mail.telepac.pt)

Mason, J. - I would like to find a group of people to research echinoderms during Summer 2000 (June-September). If anyone is interested, please contact me on e-mail [dolphi5678@aol.com](mailto:dolphi5678@aol.com) or [J.C.Mason@plymouth.ac.uk](mailto:J.C.Mason@plymouth.ac.uk) or at my address: 1 Llancayo Park, Bargoed, Mid-Glamorgan, CF81 8TS, South Wales, U.K.

Putchakarn, S. I have not enough information for identify holothurians, especially species of the family Synaptidae which infest on sponges (Most of all, *Synaptula* spp.). I would like to ask for the holothurian taxonomists to help me. Please contact me at [sumaitt@bucc4.buu.ac.th](mailto:sumaitt@bucc4.buu.ac.th)

Ram Mohan, M.K. - requests literature on asexual reproduction, reproductive biology and larval development in holothurians. Please respond to:

M.K. Ram Mohan, Tuticorin Research Centre - CMFRI, South Beach Road Extension,  
Karappad, Tuticorin - 628001 Tamilnadu, India. p- 0461 - 320102

Reich, Mike - I would like to have contact with anyone with interest in the morphology of the calcareous ring of Holothuroidea. Furthermore I am always interested in obtaining recent holothurian material for comparison with fossil holothuroid remains (ossicles and calcareous ring elements).  
**reichmi@mail.uni-greifswald.de**

Roy, Michael R. - requests samples of *Amphipholis squamata*, *Ophiactis savignyi* or any other widespread echinoderm. **michael.roy@stonebow.otago.ac.nz**

Sadler, Kirsten C. - We are interested in learning if anyone has identified the trigger which causes starfish to spawn their gametes. In addition, we would like to communicate with others who are studying the seasonal reproductive cycles of starfish. Please contact:  
**kirsten\_sadler\_phd98@post.harvard.edu**

Schoppe, Sabine - requests samples of *Ophiactis modesta* and *Ophiactis maculosa* from the Indo-Pacific. Please contact: **schoppes@pal.onl.com**

Smirnov, A.V. - It is very interesting to me to receive for determination: apodid and molpadid holothurians from all part of the ocean; holothurians from North Pacific; echinoderms from Arctic. Please contact: **alex@vig.usr.pu.ru**

Stoehr, Sabine - For our library I would very much appreciate reprints of any paper on echinoderm systematics or taxonomy, especially descriptions of new species. Since our echinoderm literature section is still rather small, older papers would be as welcome as new ones. **sabine.stoehr@nrm.se**  
Sabine Stoehr, Curator, Swedish Museum of Natural History, Department of Invertebrate Zoology, Box 50007, SE-104 05 Stockholm, Sweden.

Tahera, Qaseem - would appreciate any publication on echinoderms related to taxonomy, systematics, reproduction, larval distribution and biodiversity. Please respond to:  
Tahera, Qaseem, University of Karachi, Marine Reference Collection & Resource Centre,  
Karachi-75270, Pakistan. p- 479001-7 ext. 2257, 2377

Thorndyke, M.C. - Is there a need for an International Society of Echinoderms Biologists? Please respond to **m.thorndyke@rhnbc.ac.uk**

#### ☆☆☆☆☆ SUGGESTIONS ☆☆☆☆☆

Contributed by Daniel B. James

I would like to solicit brief accounts of modern outstanding Echinodermologists like Drs. A.H. Clark, H.L. Clark, T. Mortensen, A. Panning, S.G. Heding, F.J. Madsen, L.M. Marsh, D.L. Pawson, F.W.E. Rowe, A.M. Clark, and others with a list of their publications and a photograph in every Echinoderm Newsletter. This should serve as a source of inspiration for the young Echinodermologists. Anyone willing to contribute a biography, please contact the editor at **ahearn.cynthia@nmnh.si.edu**

## ☆☆☆☆ AILSA'S SECTION ☆☆☆☆

Contributed by Lúcia S. Campos-Creasey (USU)

I had the great pleasure of meeting John Lawrence yesterday at the Brazilian National Museum in Rio. We had a chat and he advised me that my information on *Echinometra lucunter* could be included under the 'Ailsa's section' of the Echinoderm Newsletter.

The reason for this is... when I came back to Brazil in April 1997, I had a general project which I submitted to a Brazilian funding Agency. The project concerned an evaluation of the collection of echinoderms from NE Brazil that was at the Department of Oceanography at the Federal University of Pernambuco. I was living in Pernambuco very close to the beach and one day I took some sea urchins home. These were *Echinometra lucunter*.

A big surprise came when the person who looked after my children said: "What do you do with these urchins?" (O que a senhora faz com estes "oriscos"? - In Portuguese the correct way of saying urchins is "ouriços"), I told her I studied them at the university. She replied: "Really? My neighbour actually cooks them!" (É mesmo? Minha vizinha na verdade cozinha eles!). How? (Como?) I asked. "Well, she makes omelet with them!" (Bom, ela faz omeletes com eles).

Later on she brought me the recipe from her neighbour: "put the sea urchins in a fire so that they loose their spines. Open them up and scoop the whole content with a spoon and add to some chopped onions, garlic and tomatos fried in olive oil. Add the eggs and you have the omelet! It is very tasty!", she said.

In the NE Brazil we do have a very dense population of *Echinometra lucunter* on the reefs (in some places 40-60 urchins per half square meter). I thought I should do something about it, and last year submitted a project to evaluate the viability of exploitation or even use *Echinometra lucunter* in aquaculture. In the process of writing the project, I then discovered that in Suape Port (still in Pernambuco) the fishermen community celebrate the Saint Luzia's day (December 13) with an urchin party ("ouriçada"). This is a family party that has a ritual. The whole family gets up very early and goes to the nearby reef to collect the urchins. The older people and small children stay in the boat or ashore waiting. This takes a long time. They bring the urchins back to the shore, put them in series on coconut leaves, cover them up with other leaves and burn them. They open the urchins and eat the insides with lemon or pepper. They prey, dance, chat, and adults drink beer and/or "caipirinha" (Brazilian drink with lemon, sugar and rum or vodka). The party goes well into the afternoon. I tried raw *E. lucunter*. It does have a very strong fishy flavour. I liked it.

I moved to Rio last December as I have been hired by the Univerty of Saint Ursula as a lecturer, but I am still working on the *Echinometra* project from NE Brazil. My interest in

echinoculture grew even more when I found out that in Rio there are several oriental restaurants that consume urchins from Cabo Frio, and holothurians from the southern part of the state. We have no records of the landings or how much is actually exploited, and this has become my major area of interest at the moment.

Lúcia S. Campos-Creasey  
Instituto de Ciências Biológicas e Ambientais  
Universidade Santa Úrsula  
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Tel. +55 (0)21 5525422 ramal 169  
Fax +55 (0)21 5516446  
e-mail: lsc\_creasey@usu.br

☆☆☆☆☆ ECHINODERMS IN LITERATURE ☆☆☆☆☆

Non-applied biology: "So far as the human race is concerned, the Synaptidae are absolutely useless; none of them serves as food or even as the source of articles or substances which are of the least value to man, nor do they furnish food for any animal of commercial importance."  
H.L. Clark. 1907. The apodous holothurians. Smithsonian Contributions to Knowledge. XXXV. p. 68.

Contributed by J.M. Lawrence



J. Bell. 1902. Echinoderma, in Report on the Collections of Natural History . . . of the "Southern Cross", London.

"This is a type not uncommon among Ophiurids, where there are many forms so distinct as to be called "species," but exhibiting no morphological characters of any apparent interest or significance." - after a very short and extremely uninspired description of *Ophiozona inermis*. My first reaction was "huh?" but after some thought I can say that I can truly relate to this!

Contributed by Susan Hottenrott



## How I began studying Echinoderms - Part 9.

Karim Mezali (ISMAL - Aquaculture Lab, Tipaza-Algeria)

I am an Algerian student researcher preparing doctoral thesis. My main research subject is the systematics and ecology of some Mediterranean "sea cucumbers". However, this kind of research is seldom undertaken in Algeria, and I'm the only researcher working in this area, so it is very difficult indeed to conduct very well my research work.

**The abstract of my last magister thesis:**

Few studies have been undertaken on the biology and the ecology of holothurians. In Algeria these studies are particularly few indeed. To make up this lack, a detailed study is carried out on the systematic, the biology, the distribution and the population dynamics of five holothurians species namely *Holothuria tubulosa*, *Holothuria polii*, *Holothuria forskali*, *Holothuria sanctori* and *Holothuria stellati*. A particular attention has been reserved to the micro-distribution of these species in the *Posidonia oceanica* meadow.

This study was done in one shallow-water area in the Sidi-Fredj peninsula, situated at about 20 km West of Algiers, which covers a surface of 500m<sup>2</sup> and a depth of between -0.5 and -3m. The sampling was done by scuba diving during two periods: the first period extending from June 1994 to December 1994, was destructive. It consists of mensurations and sampling of five batch composed of (115) *H. tubulosa*, (108) *H. polii*, (89) *H. forskali*, (88) *H. sanctori* and (46) *H. stellati*, and this for studying the biometrics relations. The second period not destructive, consists of counting and measuring, extend on one annual cycle, from March 1995 to February 1996, for the aim of studying the structure and dynamic of each holothurian populations.

By this study, we have defined systematically each holothurian species. The census established showed a clear dominance of *H. tubulosa* et *H. polii*. The biometrics analysis revealed one allometric relation between the contracted length and the body weight. The numerous young holothurians recorded on the fall period, result of the sexual reproduction; the reduced number of juveniles in the winter period should result from the viviparity of the adults. The micro-distribution of the holothurians in the studied area, shows that *H. tubulosa*, *H. polii* and *H. stellati* have a random distribution in the *Posidonia oceanica* sea grass, whereas *H. forskali* and *H. sanctori* confine themselves in the "tombants de matte" and between boulders. The growth parameters, the recruitment month and the age have been estimated only for *H. tubulosa*, *H. polii* and *H. sanctori*.

The data obtained in this study was compared to those obtained in others Mediterranean and tropical stations.

**KEYS WORDS:** aspidochirote holothurians, *Posidonia oceanica* sea grass, algerian basin, micro-distribution, spicules, contracted length, growth parameters, longevity, recruitment, biomass.



## *OBITUARY NOTE*

### **Maria da Natividade Albuquerque**

**(1937-1995)**

Maria da Natividade Albuquerque, born on September 8, 1937, in Teresina, Piauí (Brazil), died of cancer on September 9, 1995. Lecturer of Zoology and Marine Biology at the University of Santa Ursula, Rio de Janeiro, since 1970, she concentrated her research work on Echinoderms. Maria da Natividade was a specialist of ophiuroids. She undertook her MSc at the Oceanographic Institute, University of São Paulo, working on the taxonomy of Antarctic and Sub-Antarctic Ophiuroidea. Her PhD thesis, gained in 1987 from the Biosciences Institute of the University of São Paulo, is an important contribution to the knowledge of the taxonomy and distribution of ophiuroids from the north and northeast Brazilian continental shelf. The University of Santa Ursula is in the process of publishing her PhD thesis as a book. They also hope to release in the form of scientific papers the work she was unable to prepare for publication in the last year of her life.

She was involved in a major programme of Marine Ecology which has been carried out by the Institute of Biological and Environmental Sciences at the University of Santa Ursula, being responsible for studying the echinoderm population from the southeast continental shelf. She joined the Research Oceanographic Campaign "MD55", a French collaboration with the University of Santa Ursula, using the RV 'Marion Dufresne'. She worked on the faunal composition of Ophiuroidea from the Vitoria-Trindade seamounts. She presented her initial results at the "2nd Echinoderm European Colloquium" in Brussels, under the title 'Isolation and dispersion strategies of coastal ophiuroids from the Vitoria-Trindade seamounts'.

Maria da Natividade, known as Nati to her family and close friends, was an extraordinary person, physically small but with a big soul. Firm and determined, she enchanted all with her imperative way of talking mixed with an incredible good humour that tamed everyone. She was a good friend, always ready to listen and share, as evidenced from the many letters that continue to be sent to her from those who met her in Brazil and abroad.

Nati will always be remembered as a person extremely creative, intelligent, happy, and companion. She left her eternal mark amongst us.

Rio de Janeiro, 10 February, 1999.

Cordelia de Oliveira Castro Gueron  
Elaine Figueiredo de Albuquerque  
Lucia S. Campos-Creasey

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## DEATHS

Residence of Bloomington.

### Alan S. Horowitz

Alan S. Horowitz, 68, of Bloomington, died Thursday at Bloomington Hospital.

Born June 12, 1930, in Ashland, Ky., he was the son of Samuel and Irene (Strous) Horowitz.

An emeritus senior research scientist at Indiana University, he joined the staff there in 1965, serving as curator of paleontology and as professor of geology. He retired in 1996.



From 1957 to 1965, he was a research geologist with the Marathon Oil Co. in Denver, Colo., where he was part of a research team studying limestone.

An expert on the rocks and fossils of Indiana and the south-central United States, he was an internationally known authority on fossil blastoids and bryzoans and co-author of a book on limestones.

A 1952 graduate of Washington and Lee University, he received a master's degree from Ohio State University in 1953 and a doctorate from IU in 1957.

He was a member of many scientific and scholarly organizations and Beth Shalom Jewish Community.

Survivors include two sisters, Carol Picker of Washington Crossing, Pa., and Ann Itkin of Brooklyn, N.Y.; three stepsons, John Perry of Peoria, Ill., Peter Perry of Lexington, Ky., and Michael Perry of Marietta, Ga.; one stepdaughter, Paula Jarrett of Edinburgh; and 12 grandchildren.

He was preceded in death by his wife, Lillian Perry Horowitz, in 1992.

Funeral services will be private. Entombment will be at Valhalla Mausoleum.

Memorial services will be announced at a later date.

Day Mortuary is in charge of arrangements.

Memorial contributions may be made to IU Foundation for the Galloway-Perry fund of the department of geological sciences.

Tuesday, March 9, 1999, Corvallis Gazette-Times, Corvallis, Ore.

## Bertha Mae Cutress

Dec. 28, 1920—March 7, 1999

Bertha Mae Cutress of Corvallis died Sunday, March 7, at her home. She was 78.

She was born in Pullman, Wash., the daughter of Bliss and Etta VanDyke Dana. At age 6, she moved with her family to Temple, Texas. They moved to Corvallis in 1931. She graduated from Corvallis High School and went on to receive bachelor's and master's degrees in zoology from Oregon State College (now OSU).

She married Charles E. Cutress Jr. in 1946. After he completed his education in zoology at Oregon State, they moved to Honolulu, where they both worked and studied marine biology at the University of Hawaii. In 1955, they moved to the Washington, D.C., area. While her husband worked as a zoologist at the National Museum of Natural History of the Smithsonian Institution, she did research funded by grants administered by the Smithsonian.

They moved to Mayaguez, Puerto Rico, in 1965 and took positions in the department of marine sciences at the University of Puerto Rico, Mayaguez campus, he as a

professor and she as a researcher. Her work on sea urchins and sea cucumbers has been published in several scientific journals.

She continued to work at the university after her husband died in 1992. She retired in 1994 and returned to Corvallis. She was a member of several professional societies, the First Presbyterian Church, and various environmental and animal protection organizations.

She is survived by her brother, Roger E. Dana of California; a niece; and two nephews.

She was preceded in death by her sister, Doris Dana.

A visitation will be held from 9 a.m. to noon Tuesday, March 9, at McHenry Funeral Home.

At her request, no services will be held. Private interment will take place at a later date in Willamette National Cemetery in Portland.

Arrangements are by McHenry Funeral Home.

Memorial contributions in her name may be made to the OSU Foundation or the First Presbyterian Church in care of McHenry Funeral Home, 206 N.W. Fifth St., Corvallis, OR 97330.

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## ***BECHE-DE-MER***

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**Information Bulletin**

**Number 11 - March 1999**

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Here is the 11<sup>th</sup> edition of the Bulletin, which has been issued more quickly than usual as enough information has been received to advance the publication date.

Readers, I would like to take this opportunity to thank all those who have already contributed to the Bulletin and ask that you take an active role in its improvement, as many of you have already indicated that you find the Bulletin useful. Comments from new members are particularly welcome.

— Is the current presentation by section, i.e. 1) New Information, 2) Correspondence, 3) Publications, satisfactory?

— Which section should be given more space?

— In the 'New Information' section, are the parts on 'In situ spawning observations' and 'Asexual reproduction through fission observations' suitable?

— The column 'Aquacultural information' has been continued thanks to the collaboration of S. Battaglene from ICLARM. Do you find it useful?

— Are there any other new parts that you would like to see included?

Your suggestions and comments will be both useful and necessary for the Bulletin's development.

Bulletin no. 11 includes original articles about the resources of several countries, including Indonesia, Canada and Mexico. Many different aspects of the biology of asexual reproduction through fission and the biology of one rare species are discussed.

A detailed summary of a publication by Infofish is presented in this issue due to high interest in the subject, even though the Bulletin generally gives priority to original articles.

Chantal Conand

Beche-de-mer processing—A little more effort to get much more money while saving precious resources  
by Johnson Seeto

Beche-de-mer markets and utilisation  
by Fatima Ferdouse

Reproductive cycle of the holothurian *Holothuria scabra* in Saugi Island, Spermonde Archipelago, Southwest Sulawesi, Indonesia  
By Dr. Ambo Tuwo

Asexual reproduction parameters and the influence of fission on a *Holothuria atra* sea cucumber population from a fringing reef on Reunion Island (Indian Ocean)  
by S. Jaquemet, V. Rousset & C. Conand

Distribution and abundance of *Thelenota rubralineata* in the western Pacific: Some conservation issues  
David J. W. Lane

Recent developments in the commercialisation of the northern sea cucumber *Cucumaria frondosa*  
by Jean-François Hamel & Annie Mercier

Diving accidents related to sea-cucumber fishing at Nosy Be, Madagascar  
by Dr C. Maillaud (Reunion Island)

About the Latin name of the Japanese sea cucumber  
by Pr. V.S. Levin

Potential culture of sea cucumber in Mexico  
by Alexandra Gutiérrez-García

Observations on fission and spawning  
Communicated by Ram Mohan

Aquaculture section  
Prepared by S. Battaglene

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GEORGE, SOPHIE	ECOLOGY BIOCHEMISTRY BEHAVIOUR MORPHOLOGY
GIBSON, MICHAEL	PALEOECOLOGY BIOTIC-INTERACTIONS DEVONIAN
GIELAZYN, MICHEL LYNN	TOXICOLOGY FEEDING-BEHAVIOR ECOLOGY OPHIUROIDEA
GIL CID, DOLORES	PALAEOBIOLOGY PALAEOECOLOGY MORPHOLOGY CRINOIDEA CYSTOIDS
	CARPOIDEA LOWER-PALEOZOIC ORIGIN-OF-ECHINODERMS
GINANOVA, TALIA	MUSCLE-REGENERATION-MECHANISMS
GIUDICE, GIOVANNI	MOLECULAR-BIOLOGY DEVELOPMENTAL-BIOLOGY
GLUCHOWSKI, EDWARD	CRINOIDEA TAXONOMY BIOSTRATIGRAPHY PALEOECOLOGY
GOGGIN, LOUISE	ASTEROIDEA PATHOLOGY PARASITES BIOLOGICAL-CONTROL
GONGADZE, GURAM	ECHINOIDEA LATE-CRETACEOUS PALEOGENE EVOLUTION SYSTEMATICS
	PALEOBIOGEOGRAPHY STRATIGRAPHY
GOODING, RICHARD	ECHINOIDEA DIADEMATID-ASSOCIATIONS
GORCHAKOV, IGOR	POPULATION-ECOLOGY ECOPHYSIOLOGY GENETICS
GOUVEIA-MONTEIRO, ANA MARIA	OPHIUROIDEA
GRABOWSKY-KAAIALII, GAIL	EVOLUTION BIOMECHANICS DEVELOPMENT DISPERSAL ECOLOGY
GREENSTEIN, BENJAMIN	ASTEROIDEA ECHINOIDEA TAPHONOMY FOSSIL RECENT
	CROWN-OF-THORNS STARFISH
GREENWOOD, AMY	ASTEROIDEA REPRODUCTION SEASONALITY SELF-FERTILIZATION
GROSJEAN, PHILIPPE	SOMATIC-GROWTH MODELING AQUACULTURE ECHINOIDEA
GROVES, CATHY	ASTEROIDEA BIOGEOGRAPHY SYSTEMATICS
GRYGIER, MARK	PARASITOLOGY EPIZOIC-FAUNA GALLS-AND-CYSTS
GUDMUNDSSON, JON EGGERT	ECHINOIDEA ECOLOGY POPULATION
GUERRAZZI, MARIA	ASTEROIDEA
GUILLOU, MONIQUE	SEA-URCHIN ECOTOXICOLOGY ECOLOGY
GURREA, ISIDRO	ECHINOIDEA CRETACEOUS CENOZOIC
	WESTERN-EUROPEAN-MEDITERRANEAN-BASIN
GUTT, JULIAN	BIODIVERSITY ECOLOGY
HADEL, VALERIA FLORA	HOLOTHUROIDEA BIOLOGY ECOLOGY
HAGEN, NILS	ECHINOIDEA ECOLOGY DISEASE CULTIVATION
HAMEL, JEAN-FRANCOIS	REPRODUCTION SETTLEMENT BEHAVIOR CHEMICAL-ECOLOGY
HAMZA HASSAN, MOHAMED	ECOLOGY
HAND, CLAUDIA	HOLOTHUROIDEA FISHERIES DISTRIBUTION
HAUDE, REIMUND	TAXONOMY PALEOECOLOGY EVOLUTION
HAVARDSSON, BJORGOLFUR	ECHINOIDEA



HEINZELLER, THOMAS	CRINOIDEA ULTRASTRUCTURE NEUROANATOMY
HENDLER, GORDON	OPHIUROIDEA TAXONOMY BEHAVIOR FUNCTIONAL-MORPHOLOGY
HERDENDORF, CHARLES	ABYSSAL ASTEROIDEA BRISINGIDAE ECHINOIDEA
HESS, HANS	TAXONOMY PALEOECOLOGY CRINOIDEA ASTEROIDEA OPHIUROIDEA
HICKMAN, JR., CLEVELAND	SYSTEMATICS ECOLOGY
HIGHSMITH, RAYMOND	ECOLOGY REPRODUCTION COMMUNITY-ECOLOGY
HILL, ROBERT	COMPARATIVE-PHYSIOLOGY
HOBERG, MAX	TAXONOMY ECOLOGY FEEDING REPRODUCTION
HODGSON, ALAN	ASTEROIDEA MORPHOLOGY
HOFFMAN, JENNIFER	ECHINOIDEA LARVAE UV
HOLTERHOFF, PETER	CRINOIDEA FOSSIL PALEOECOLOGY SYSTEMATICS
HOOD, SARAH	TAXONOMY BIOGEOGRAPHY DEEP-WATER
HOOPER, ROBERT	ECHINOIDEA ECOLOGY AQUACULTURE CONSERVATION
HOPKINS, THOMAS	ASTEROIDEA ECHINOIDEA SYSTEMATICS
HOSHI, MOTONORI	ECHINOIDEA ASTEROIDEA FERTILIZATION ACROSOME-REACTION
	GLYCOCONJUGATES SIGNAL-TRANSDUCTION
HOTCHKISS, FREDERICK	OPHIUROIDEA STELLEROIDEA PALEOZOIC PENTAMERISM
HOTTENROTT, SUSAN	OPHIUROIDEA SYSTEMATICS DEEP-SEA
IRIMURA, SEIICHI	OPHIUROIDEA TAXONOMY MORPHOLOGY ECOLOGY
ISHIDA, YOSHIAKI	PALEOECOLOGY PHYSIOLOGY OPHIUROIDEA
IVY, W. GRISILDA	HOLOTHUROIDEA
JABLONSKI, DAVID	ECHINOIDEA CRINOIDEA FOSSIL
JACOBSEN, NANCY	ASTEROIDEA TAXONOMY DISTRIBUTION REPRODUCTION
JAECKLE, WILLIAM	LARVAE PHYSIOLOGY ECOLOGY MORPHOLOGY
JAGT, JOHN	TAXONOMY PALAEOBIOLOGY BIOZONATION FUNCTIONAL-MORPHOLOGY
JAMES, DANIEL	HATCHERY CULTURE TAXONOMY ASTEROIDEA OPHIUROIDEA ECHINOIDEA
	HOLOTHUROIDEA
JAMES, DAVID	ECHINOIDEA
JAMIESON, GLEN	BIODIVERSITY HABITAT-MODIFICATION SURVEY
JANIES, DANIEL	ASTEROIDEA EVOLUTION DEVELOPMENT
JEFFERIES, RICHARD P.	PHYLOGENETIC-ORIGIN EMBRYOLOGY
JEFFERY, CHARLOTTE	ECHINOIDEA-PHYLOGENIES MORPHOLOGICAL & MOLECULAR
	ECHINOIDS-OVER-THE-K-T-BOUNDARY ECHINOID-LARVAL-STRATEGY
JELL, PETER	TAXONOMY BIOSTRATIGRAPHY AUSTRALIA EVOLUTION
JELLETT, JOANNE	IMMUNITY DISEASE
JOHNSON, SONKE	PHOTORECEPTION ORIENTATION OPHIUROIDEA
JUINIO-MENEZ, ANNETTE	CULTURE MANAGEMENT POPULATION-GENETICS LARVAL-ECOLOGY
JUNQUEIRA, ANDREA	REPRODUCTION RECRUITMENT SETTLEMENT POPULATION-DYNAMICS
KAMMER, THOMAS	CRINOIDEA PALEOZOIC TAXONOMY EVOLUTION PALEOECOLOGY
KASYANOV, VLADIMIR	ASTEROIDEA REPRODUCTION CELLULAR-MECHANISMS
KAWAUCHI, GISELE YUKIMI	HOLOTHUROIDEA APODIDA REPRODUCTION DISPERSION
KELLEY, SCOTT	ECHINOIDEA-TAXONOMY-ONTOGENY CRETACEOUS-COMATULID-BIODIVERSITY
KELLY, MAEVE	ECHINOCULTURE PSAMMECHINUS-MILIARIS NUTRITION GROWTH
KERR, ALEXANDER	HOLOTHUROIDEA ECOLOGY EVOLUTION SYSTEMATICS
KEUSKAMP, DOM	ECHINOIDEA
KLIKUSHIN, VLADIMIR	TAXONOMY PALEOBIOLOGY
KLINGER, THOMAS	ECHINOIDEA HOLOTHUROIDEA NUTRITION ECOLOGY
KNOTT, K. EMILY	ASTEROIDEA SYSTEMATICS EVOLUTION
KOBAYASHI, NAOMASA	ECHINOIDEA MARINE-POLLUTION BIOASSAY SPAWNING-PERIODICITY
KOGO, ICHIZO	TAXONOMY DISTRIBUTION PHYLOGENY EXISTING-CRINOIDEA
KRISHNARAJAH, PADMINI	HOLOTHUROIDEA TAXONOMY FOOD-HABITS REPRODUCTIVE-BIOLOGY
KURIHARA, TAKEO	ASTEROIDEA DISTRIBUTIONAL-PATTERN ACTIVITY-RHYTHM
	LIFE-HISTORY
KYTE, MICHAEL	OPHIUROIDEA ASTEROIDEA SYSTEMATICS TAXONOMY BEHAVIOR
	NORTHEAST-PACIFIC
LACEY, KATRINA	HOLOTHUROIDEA
LAMBERT, PHILIP	SYSTEMATICS HOLOTHUROIDEA TAXONOMY NATURAL-HISTORY
LANDEIRA FERNANDEZ, ANA MARIA	BIOCHEMISTRY MUSCLE ATPASE SARCOPLASMIC-RETICULUM
	MUSCLE-PHYSIOLOGY CALCIUM-REGULATION
	REGENERATION-INTERNAL-ORGANS
LANE, N. GARY	CRINOIDEA PALEOZOIC
LAWRENCE, JOHN	NUTRITION REPRODUCTION PHYSIOLOGY STRATEGIES
LE MENN, JEAN	SYSTEMATICS PALEOBIOLOGY PALEOECOLOGY PALEOBIOGEOGRAPHY
	BIOSTRATIGRAPHY
LEE, YOUN-HO	EVOLUTION EMBRYOLOGY DEVELOPMENT
LEMBO, LUIZ	CRINOIDEA

LESSER, MICHAEL	ECHINOIDEA
LESSIOS, HARILAOS	ECHINOIDEA PHYLOGENY POPULATION-GENETICS
LEVERONE, JAY	ASTEROIDEA REPRODUCTION
LEVIN, VALERY	SHALLOW-WATER-HOLOTHUROIDEA SYSTEMATICS BIOLOGY FEEDING FISHERIES
LEWIS, DAVID	PALAEONTOLOGY ECHINOIDEA
LIAO, YULIN	OPHIUROIDEA HOLOTHUROIDEA TAXONOMY MARICULTURE
LITVINOVA, NINA	OPHIUROIDEA TAXONOMY MORPHOLOGY BEHAVIOUR ECOLOGY
LORDSON, JINBERT	HOLOTHUROIDEA
LUCAS, JOHN	ECOPHYSIOLOGY AQUACULTURE ACANTHASTER
MACURDA, JR., D. BRADFORD	BLASTOIDEA COMATULIDS ISOCRINIDS
MACZYNSKA, STEFANIA	ECHINOIDEA MIOCENE PARATETHYS-BASIN MEDITERRANEAN
MAGSINO, RICHARD	POPULATION-GENETICS ASTEROIDEA
MAH, CHRISTOPHER	ASTEROIDEA SYSTEMATICS GONIASTERIDAE
MAHARAVO, JEAN	TAXONOMY BIOLOGY BIODIVERSITY
MAIER, MARTA	POLAR-METABOLITES BIOLOGICAL-ACTIVITY ISOLATION
MAKRA, ATHENA	STRUCTURAL-ELUCIDATION
MALLEFET, JEROME	POPULATION-DYNAMICS BEHAVIOUR REPRODUCTION REGENERATION
MANIKANDAN K.P.	BIOLUMINESCENCE PHYSIOLOGY NEUROBIOLOGY
MANIKANDAN K.P.	FUNCTIONAL-ECOLOGY
MANNI, RICCARDO	HOLOTHUROIDEA EMBRYOLOGY HATCHERY
MANNIFIELD, KAY	HOLOTHUROIDEA EMBRYOLOGY HATCHERY
MANSO, CYNTHIA	SYSTEMATICS MORPHO-FUNCTIONALITY ONTOGENESIS EVOLUTION
MAPLES, CHRISTOPHER	non-isocrinid crinoids
MARAN, ALEKSANDRA	PALAEOECOLOGY TAXONOMY TAPHONOMY BIODIVERSITY-(+ EXTINCTIONS)
MARSH, LOISETTE	OPHIUROIDEA ECHINOIDEA TAXONOMY CRETACEOUS
MARTIN, RICHARD	DEVONIAN CARBONIFEROUS MISSISSIPPIAN PENNSYLVANIAN
MARTINEZ, PRISCILLA	PERMIAN PALEOECOLOGY PALEOBIOGEOGRAPHY CRINOID BLASTOID
MARTINEZ, SERGIO	MICROCRINOID
MASCARENHAS, BERNARDO JOSE	ECHINOIDEA CRETACEOUS SYSTEMATICS BIOSTRATIGRAPHY
MASON, JOANNE	PALAEOECOLOGY TAPHONOMY
MASSIN, CLAUDE	ASTEROIDEA TAXONOMY ECHINODERM-ZOOGEOGRAPHY
MATA PEREZ, EUSTOLIA	LARVAL-BIOLOGY ECOLOGY INVASION-BIOLOGY
MATERIA-ROWLAND, CHRISTINE	HOLOTHUROIDEA REPRODUCTION LARVAL-BIOLOGY
MATTOS-SEGOVIA, ELIO	PALEONTOLOGY TAXONOMY PALEOECOLOGY ECHINOIDEA
MAUBON, ROGER	ASTEROIDEA ECOLOGY TAXONOMY POPULATION-DYNAMICS
McBRIDE, SUSAN	ASTEROIDEA BIODIVERSITY BEHAVIOUR ECOLOGY
McCLINTOCK, JAMES	HOLOTHUROIDEA TAXONOMY ZOOGEOGRAPHY
McEDWARD, LARRY	ECHINODERMATA ASTEROIDEA LUIDIIDAE MEXICO TAXONOMY
MCGOVERN, TAMARA	TAXONOMY BIODIVERSITY ECOLOGY
McKENZIE, J. DOUGLAS	ECHINOIDEA LARVAE REPRODUCTION EMBRYOLOGY DEVELOPMENT
McLELLAND, JERRY	SYSTEMATICS ECHINOIDEA
McNAMARA, KENNETH	ECHINOIDEA FISHERIES AQUACULTURE
MEDEIROS-BERGEN, DOT	CHEMICAL-ECOLOGY REPRODUCTION NUTRITION ECOLOGY
MELIKOV, OKTAI HAMZA	LARVAL-ECOLOGY LIFE-CYCLE-EVOLUTION
MERCIER, ANNIE	OPHIACTIS FISSION REPRODUCTION GENDER-SPECIFIC
MESSING, CHARLES	FUNCTIONAL-BIOLOGY
MEYER, CHRISTIAN	TAXONOMY BIODIVERSITY GULFOFMEXICO WESTINDIES
MEYER, DAVID	ECHINOIDEA PALEONTOLOGY PHYLOGENY
MEZALI, KARIM	LIFE-HISTORY-TACTICS RECRUITMENT
MILLER, ROBERT	LARVAL-MOLECULAR-IDENTIFICATION
MINTZ, LEIGH	ECHINOIDEA EVOLUTION MORPHOLOGY HOLASTEROID SPATANGO JURASSIC
MIRONOV, ALEXANDER	CRETACEOUS EOCENE
MITROVIC-PETROVIC, JOVANKA	ASTEROIDEA HOLOTHUROIDEA OPHIUROIDEA ECHINOIDEA BEHAVIOR
MLADENOV, PHILIP	REPRODUCTION MORPHOLOGY
	RECENT-CRINOIDEA ECOLOGY BIOGEOGRAPHY SYSTEMATICS
	MESOZOIC-ECHINODERMS PALEOBIOLOGY TAPHONOMY
	CRINOIDEA FOSSIL RECENT TAPHONOMY
	CARYOLOGY ECOLOGY LIFE-CYCLES NUTRITION HOLOTHUROIDEA
	BIOGEOGRAPHY EVOLUTION FISHERY ECOLOGY
	EARLY-PALEOZOIC-FORMS ORIGIN-&-EARLY-EVOLUTION
	TAXONOMY BIOGEOGRAPHY CRINOIDEA ASTEROIDEA ECHINOIDEA
	HOLOTHUROIDEA
	TAXONOMY PALEOECOLOGY MORPHOLOGY EVOLUTION ECHINOIDEA
	REPRODUCTION GENETICS ECOLOGY AQUACULTURE FISHERIES

MONTAGUE, CHRISTOPHER  
 MOOI, RICHARD  
 MOONEY, ROBERT  
 MOORE, ABIGAIL  
 MORGAN, ANDREW  
 MORGAN, KATHERINE  
 MORRILL, JOHN  
 MOTOKAWA, TATSUO  
 MOUCHATY, SUZETTE  
 MULLER, CLARE  
 MUNK, ERIC  
 NAIDENKO, TAMARA  
 NAKAI, SAORI  
 NAKAMURA, RAYMOND  
 NAKANO, EIZO  
 NEBELSICK, JAMES  
 NEILL, BRUCE  
 NEPOTE, ANA CLAUDIA  
 NESTLER, HELMUT  
 NEUMANN, CHRISTIAN  
 NICHOLS, DAVID  
 NICOSIA, UMBERTO

NISHIHARA, MORITAKA  
 NISHIZAKI, MICHAEL  
 NOJIMA, SATOSHI  
 O'CONNOR, BRENDAN  
 O'HARA, TIMOTHY  
 O'LOUGHLIN, P. MARK  
 OHTA, SUGURU  
 OJEDA, F. PATRICIO  
 OJI, TATSUO  
 OLIVARES CARDENAS, MARCO  
 OLSZEWSKA-NEJBERT, DANUTA  
 OLVER, JANE  
 PABIAN, ROGER  
 PAGETT, RICHARD  
 PALUMBI, STEVE

PARMA, SARA GRACIELA  
 PARSLEY, RONALD  
 PAULS, SHEILA MARQUES  
 PENCHASZADEH, PABLO  
 PETR, VACLAV

PETROVA, IRINA  
 PHILIPPE, MICHEL  
 PIEPENBURG, DIETER  
 PODOLSKY, ROBERT

PORTELL, ROGER  
 PRESTEDGE, GEOFFREY  
 PROKOP, RUDOLF JAN

PUTCHAKARN, SUMAITT  
 RAJAKUMAR, C.  
 RAM MOHAN, M.

REGIS, MARIE-BERTHE  
 REICH, MIKE

RINELLI, PAOLA  
 RINGVOLD, HALLDIS  
 ROBERTS, SARAH  
 ROBINSON, SHAWN  
 ROCCATAGLIATA, ALEJANDRO

ASTEROIDEA REGENERATION FISHERIES  
 ECHINOIDEA  
 COMMUNITY-ECOLOGY INTRASPECIFIC-COMPETITION  
 BIODIVERSITY SUSTAINABLE-EXPLOITATION  
 HOLOTHUROIDEA FISHERIES DEVELOPMENT REPRODUCTION  
 LIFE-CYCLE-EVOLUTION  
 ECHINOIDEA DEVELOPMENT  
 CATCH-CONNECTIVE-TISSUE STALKED-CRINOIDS  
 ECHINOIDEA CLYPEASTEROIDEA SYSTEMATICS  
 HOLOTHUROIDEA TAXONOMY ECOLOGY  
 GROWTH REPRODUCTION  
 ECHINOIDEA METAMORPHOSIS POLLUTION BIOASSAY CRYOPRESERVATION  
 ECHINOIDEA TAXONOMY  
 ECHINOIDEA ECOLOGY EVOLUTION BIOMECHANICS EDUCATION  
 DEVELOPMENT SKELETOGENESIS EXTRACELLULAR-MATRIX ECHINOIDEA  
 ECHINOIDEA ECOLOGY PALAEONTOLOGY TAPHONOMY BIODIVERSITY  
 BIOGEOGRAPHY ECHINOMETRIDS GENETICS SYSTEMATICS  
 BIODIVERSITY ECOLOGY EVOLUTION  
 ECHINOIDEA CRETACEOUS TAXONOMY PALEOECOLOGY  
 ECHINOIDEA SPATANGOIDA TAXONOMY ECOLOGY  
 FUNCTIONAL-MORPHOLOGY REPRODUCTIVE-STRATEGIES  
 SYSTEMATICS PALAEOECOLOGY Jurassic crinoids; EVOLUTION  
 STRATIGRAPHY non-isocrinid crinoids  
 ECOLOGY BIODIVERSITY POPULATION BEHAVIOR  
 ECHINOIDEA RECRUITMENT ECOLOGY JUVENILES SHELTERING  
 LIFE-HISTORY-TACTICS PREDATION-PRESSURE ECOLOGICAL-ENERGETICS  
 OPHIUROIDEA TAXONOMY BIOTURBATION DENSITY-REGULATORY-FACTORS  
 TAXONOMY NATURAL-HISTORY BIOGEOGRAPHY CONSERVATION  
 HOLOTHUROIDEA TAXONOMY  
 TAXONOMY DISTRIBUTION ZONATION  
 ECOLOGY BIOLOGY FEDDING-BIOLOGY DISTRIBUTION  
 CRINOIDEA TAXONOMY EVOLUTION BIOGEOGRAPHY REGENERATION  
 HOLOTHUROIDEA TAXONOMY  
 CRETACEOUS-IRREGULAR-ECHINOIDS PALEOBIOGEOGRAPHY STRATIGRAPHY  
 ECOLOGY ECHINOIDEA  
 CRINOIDEA-EPIBIONTS PARASITES PREDATORS COMMENSALS  
 BRACKISH-WATER-ECOLOGY CASPIAN SEA  
 ECHINOIDEA SPECIATION POPULATIONS-STRUCTURE  
 MOLECULAR-EVOLUTION  
 PALEOBIOGEOGRAPHY ECHINOIDEA MESOZOIC-CENOZOIC  
 PALEONTOLOGY PHYLOGENY  
 TAXONOMY ECOLOGY MORPHOLOGY  
 ECHINOIDEA ASTEROIDEA ECOLOGY  
 SYSTEMATICS TAXONOMY PALEOBIOLOGY PALEOECOLOGY  
 BIOSTRATIGRAPHY  
 MORPHOLOGY  
 ECHINOIDEA PALEOECOLOGY STRATIGRAPHY TAXONOMY  
 ECOLOGY OPHIUROIDEA  
 REPRODUCTION FERTILIZATION LARVAL-BIOLOGY PHYSIOLOGY  
 BIOCHEMISTRY  
 TAXONOMY BIOSTRATIGRAPHY  
 PATIRIELLA-vivipara  
 EARLY-PALAEOZOIC-ECHINODERMATA BIOSTRATIGRAPHY  
 PALEOBIOLOGY  
 TAXONOMY ECOLOGY BIODIVERSITY  
 BIOLOGY ECOLOGY  
 HOLOTHUROIDEA REPRODUCTIVE-BIOLOGY LARVAL-DEVELOPMENT  
 ASEXUAL-REPRODUCTION REGENERATION  
 BIOLOGY ECOLOGY POLLUTION ENVIRONMENT  
 TAXONOMY MORPHOLOGY EVOLUTION FOSSIL-HOLOTHUROIDEA  
 OPHIOCISTIOIDEA  
 BIOGEOGRAPHY ECOLOGY BIODIVERSITY  
 ASTEROIDEA TAXONOMY DISTRIBUTION  
 MARINE-BIOLOGY ECHINODERMS  
 CULTURE FISHERY ECOLOGY POPULATION-DYNAMICS  
 ASTEROIDEA OPHIUROIDEA PHYSIOLOGICALLY-ACTIVE-STERIODS

RODRIGUEZ, SEBASTIAN	ECHINOIDEA ECOLOGY SPATIAL-DISTRIBUTION
	USE-OF-DRIFT-ALGAE
ROGERS-BENNETT, LAURA	ECHINOIDEA GROWTH
ROSE, EDWARD	FOSSIL ECHINOIDEA
ROTMAN CLARK, HELEN	ASTEROIDEA OPHIUROIDEA TAXONOMY ANATOMY
ROUX, MICHEL	CRINOIDEA TAXONOMY ECOLOGY BIOGEOGRAPHY
ROWE, FRANK	ECHINODERMATA SYSTEMATICS ZOOGEOGRAPHY EVOLUTION
ROY, MICHAEL	EVOLUTIONARY-GENETICS CONSERVATION-GENETICS
	PHYLOGEOGRAPHY HUMAN-AIDED-MARINE-INTRODUCTIONS
	MARINE-SPECIATION NEW-ZEALAND-FIORDS
SABA, MASAKI	ASTEROIDEA TAXONOMY
SADLER, KIRSTEN	CELL-BIOLOGY MEIOSIS REPRODUCTION
SAMYN, YVES	TAXONOMY FEEDING-BIOLOGY REPRODUCTIVE-BIOLOGY HOLOTHUROIDEA
	ECHINOIDEA-REGULAR
SANO, MINORU	ECHINOIDEA POPULATION-ECOLOGY
SASTRY, DWADASI	TAXONOMY ECOLOGY ECHINODERMATA CORAL-REEFS MANAGEMENT
SAUCEDE, THOMAS	HOLASTEROID POURTALESIIDAE APICAL-SYSTEM
SCALLY, KEVIN	MASTECATORY-FUNCTION ECOLOGY DENTAL-MORPHOLOGY EVOLUTION
SCHELTEMA, RUDOLF	LARVAL-DISPERSAL MODE-OF-REPRODUCTION
SCHOPPE, SABINE	ECHINODERM-ASSOCIATES OPHIUROIDEA TAXONOMY
	COASTAL-RESOURCE-MANAGEMENT
SCHUETZ, ALLEN	JUVENILES
SCHULTZ, HEINKE	TAXONOMY BIOLOGY ECOLOGY
SEETO, JOHNSON	TAXONOMY REPRODUCTION
SERAFY, D. KEITH	ECHINOIDEA TAXONOMY ECOLOGY
SEVASTOPULO, GEORGE	PALEONTOLOGY PHYLOGENY CRINOIDEA
SEWELL, MARY	HOLOTHUROIDEA BIOGEOGRAPHY LARVAL-ECOLOGY
	LARVAL-DEVELOPMENT REPRODUCTION
SHEPHERD, SCORESBY	ECHINOIDEA ECOLOGY
SHICK, J. MALCOLM	PHYSIOLOGY PHOTOBIOLOGY BIOCHEMISTRY DEVELOPMENT
SHIRLEY, THOMAS	CRAB-ASTEROID-INTERACTIONS
SIBUET, MYRIAM	TAXONOMY BIODIVERSITY
SINGLETERY, ROBERT	ECOLOGY TAXONOMY
SKOLD, MATTIAS	OPHIUROIDEA REGENERATION DEVELOPMENT
SLOAN, NORMAN	HOLOTHUROIDEA FISHERIES
SMILEY, SCOTT	HOLOTHUROIDEA PHYSIOLOGY DEVELOPMENT EVOLUTION
SMIRNOV, ALEXEI	TAXONOMY ZOOGEOGRAPHY EVOLUTION PHYLOGENY PALEONTOLOGY
	HOLOTHUROIDEA
SMIRNOV, IGOR	POLAR-OCEANS OPHIUROIDEA DATABASES
SMITH, ALBERT	PATHOLOGY/PATHOBIOLOGY HEMATOLOGY IMMUNE-SYSTEM
	LINKS-TO-PROTOCHORDATES/VERTEBRATES
SMITH, ANDREW	PALAEOBIOLOGY SYSTEMATICS
SOLIS-MARIN, FRANCISCO	ECOLOGY MOLECULAR TAXONOMY NORTH-ATLANTIC
SOLOVJEV, ANDREY	ECHINOIDEA EVOLUTION PALEOECOLOGY
SONNENHOLZNER, JORGE	ECHINOIDEA ECOLOGY DISEASE IMMUNE-RESPONSE
SPENCER, LARRY	POPULATION-ECOLOGY SYMBIOTIC-RELATIONSHIPS
	LIFE-HISTORY-STUDIES
SPIRINA, IRINA	MORPHOLOGY REGENERATION HOLOTHUROIDEA
SPIRLET, CHRISTINE	SEA-URCHIN ECHINICULTURE REPRODUCTION GONAD-GROWTH
SPONER, RENATE	EVOLUTION GENETICS BIODIVERSITY BIOGEOGRAPHY
STANCYK, STEPHEN	OPHIUROIDEA REGENERATION PREDATION POPULATION GROWTH
STEWART, BRIAN	OPHIUROIDEA REPRODUCTION ANATOMY PHYSIOLOGY
STICKLE JR., WILLIAM	PHYSIOLOGY TOLERANCE ASTEROIDEA
STOEHR, SABINE	OPHIUROIDEA BIODIVERSITY PHYLOGENY
STORC, RICHARD	OPHIUROIDEA ASTEROIDEA TAXONOMY CRETACEOUS
STRATHMANN, RICHARD	LARVAE EVOLUTION BODY-PLANS
STUMP, RICHARD	ASTEROIDEA POPULATION-DYNAMICS ECOLOGICAL-MODELLING
	ENVIRONMENTAL-MONITORING
SUMRALL, COLIN	PHYLOGENY SYSTEMATICS PALEOECOLOGY EDRIOASTEROID
SUTER, SHERMAN	ECHINOIDEA PALEOBIOLOGY
TABLADO, ALEJANDRO	ASTEROIDEA TAXONOMY SOUTH-ATLANTIC
TAHERA, QASEEM	BIODIVERSITY BIOLOGY LARVAL-DISTRIBUTION
	POPULATION-DYNAMICS
TAKAHASHI, KEIICHI	MUSCLE-PHYSIOLOGY SPERM-MOTILITY CONNECTIVE-TISSUE
TALBOT, TIFFANY	OPHIUROIDEA REPRODUCTION DEVELOPMENT BEHAVIOR
	FUNCTIONAL-MORPHOLOGY



TAVARES, YARA A.	ECHINOIDEA ECOLOGY REPRODUCTION POPULATION-DYNAMICS
THANDAR, AHMED	MORPHOMETRY
THAPANAND, THANITHA	HOLOTHUROIDEA TAXONOMY SYSTEMATICS ZOOGEOGRAPHY
THIERRY, JACQUES	REPRODUCTIVE-BIOLOGY
THORNDYKE, MICHAEL	POPULATION-DYNAMICS fish and invertebrates
THORSEN, MARIANNE	BIODIVERSITY EVOLUTION MORPHOLOGY
TIAGO, CLAUDIO GONCALVES	NEUROBIOLOGY REGENERATION DEVELOPMENT
TOMINAGA, HIDEYUKI	ECHINOIDEA GUT-MICROBIOTA
	BIOLOGY ECHINODERMS
	ECHINOIDEA BROODING-SEA-URCHINS AGE-DETERMINATION DEVELOPMENT
	POPULATION-ECOLOGY
TOMMASI, LUIZ ROBERTO	OPHIUROIDEA SYSTEMATICS ANTARCTICA PALAEOBIOGEOGRAPHY
	BIOGEOGRAPHY
TRONCOSO, JUAN	TAXONOMY ANTARCTIC
TURNER, RICHARD	ECHINOIDEA OPHIUROIDEA SYSTEMATICS
TURON, XAVIER	REPRODUCTIVE-BIOLOGY RECRUITMENT POPULATION-DYNAMICS
	ECOTOXICOLOGY
TUTERA, PETER	TAXONOMY BIODIVERSITY CONSERVATION
UBAGHS, GEORGES	LOWER-PALAEOZOIC-ECHINODERMS CRINOIDS CARPOIDS
UTHICKE, SVEN	HOLOTHUROIDEA POPULATION-GENETICS ASEXUAL-REPRODUCTION
	INTERACTIONS-WITH-ENVIRONMENT
v. JUTERZENKA, KAREN	OPHIUROIDEA ARCTIC-ECHINODERMS-ECOLOGY
	FEEDING-STRATEGIES POPULATION-DYNAMICS
	GRAZING BEHAVIOR REPRODUCTIVE-ECOLOGY
VADAS, ROBERT	ECHINOIDEA TAXONOMY EVOLUTION
VADET, ALAIN	ECHINOIDEA ECOLOGY
VALENTINE, JOE	OPHIUROIDEA ECHINOIDEA ECOLOGY
VALENTINE, JOHN	ECHINOIDEA CAMPANIAN-MAASTRICHTIAN-DANIAN NW-EUROPE TAXONOMY
VAN DER HAM, RAYMOND W.J.M.	ECOLOGY DISTRIBUTION BEHAVIOUR BIO-EROSION
VAN HOUT, TESSA	DEFENSIVE-MECHANISMS MORPHOLOGY SYMBIOSIS
VANDENSPIEGEL, DIDIER	OPHIUROIDEA ECHINOIDEA SYSTEMATICS
VEGA, JUAN TORRES	TAXONOMY DISTRIBUTIONAL-ECOLOGY SYMBIOTIC-RELATIONSHIPS
VELARDE, RONALD	REPRODUCTION ASTEROIDEA
VENTURA, CARLOS RENATO	ECHINOIDEA BEHAVIOUR
VERLING, EMMA	TAXONOMY BIODIVERSITY BIOGEOGRAPHY
VIADA, STEPHEN	ASTEROIDEA MOLECULAR-PHYLOGENY
VICKERY, MINAKO	REPRODUCTION INVERTEBRATES BIOTIC-ABIOTIC-CONDITIONS
VIKTOROVSKAYA, GALINA	ASTEROIDEA SPATANGOIDA TAXONOMY PHYLOGENY
VILLIER, LOIC	OPHIUROIDEA
VISTISEN, BODIL	ECOLOGY
VOLBEHR, UTE	HOLOTHUROIDEA CYTOGENETICS POPULATION-GENETICS
von BRAND, ELISABETH	ECHINOIDEA REPRODUCTION
WASSON, KRISTINA	GROWTH REPRODUCTION NUTRITION PHYSIOLOGY HORMONES
WATTS, STEPHEN	CRINOIDEA PALEOZOIC TAXONOMY PALEOBIOGEOGRAPHY
WEBSTER, GARY	CRINOIDEA MORPHOLOGY NERVOUS-SYSTEM CONNECTIVE-TISSUE
WELSCH, ULRICH	CRINOIDEA LARVAL-BIOLOGY TAXONOMY SENSORY-BIOLOGY
WHITE, CHRIS	CRINOIDEA TAXONOMY PALAEOBIOGEOGRAPHY PHYLOGENY PALAEOZOIC
WIDDISON, ROSANNE	REPRODUCTIVE-BIOLOGY POPULATION-GENETICS ECOLOGY HOLOTHUROIDEA
WIGHAM, BEN	OPHIUROIDEA ECHINOIDEA FUNCTIONAL-MORPHOLOGY
WILKIE, IAIN	POPULATION-GENETICS MOLECULAR-PHYLOGENY EXPRESSED-GENES
WILLCOX, MARK	CHEMICAL-ECOLOGY LARVAL-BIOLOGY HERBIVORY LIFE-HISTORY
WILLIAMSON, JANE	ZOOGEOGRAPHY AZORES
WIRTZ, PETER	ECHINOIDEA TAPHONOMY ECOLOGY ACTUOPALEONTOLOGY
WORHEIDE, GERT	EVOLUTION DEVELOPMENT MORPHOGENESIS
WRAY, GREGORY	LARVAL-DEVELOPMENT BIOGEOGRAPHY
YAMAGUCHI, MASASHI	METAMORPHOSIS ECHINOIDEA DEVELOPMENT
YANAGISAWA, TOMIO	PHYLOGENY MORPHOGENESIS EMBRYOGENESIS
YOKOTA, YUKIO	COLLAGEN EXTRACELLULAR-MATRIX ELM
YOSHIZATO, KATSUTOSHI	TAXONOMY BIODIVERSITY ECOLOGY DISTRIBUTION
ZAVODNIK, DUSAN	TAXONOMY ASTEROIDEA
ZEIDLER, WOLFGANG	TAXONOMY TAPHONOMY PALEOECOLOGY
ZITT, JIRI	



☆☆☆☆ ECHINODERM WEB PAGES ☆☆☆☆

David Billett - <http://www.soc.soton.ac.uk/GDD/DEEPSEAS>  
DEEPSEAS Benthic Biology Group at Southampton Oceanography Centre

Francesco Bonasoro - <http://imiucca.csi.unimi.it/~echino/5ece7.htm>

Thomas Brey - <http://www.awi-bremerhaven.de>

Ron Clouse - <http://www.clouseart.com/>

Chantal Conand - [http://www.univ-reunion.fr/t10\\_fac\\_sciences/t10\\_plaquette/ecomar.htm](http://www.univ-reunion.fr/t10_fac_sciences/t10_plaquette/ecomar.htm)

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Costello, Mark J. - developing a European Register of Marine Species: details at web site  
[erms.biol.soton.ac.uk](http://erms.biol.soton.ac.uk)

Ebert, T. A. 1998. Plant and Animal Populations. Methods in Demography. Academic Press, San Diego, CA 312p The book includes various echinoderm examples for illustrating analysis of growth, survival, allometry and matrix methods; see  
[http://www.sci.sdsu.edu/Cornered\\_Rat/](http://www.sci.sdsu.edu/Cornered_Rat/)

Jon Eggert - (contact: [midvangur@islandia.is](mailto:midvangur@islandia.is)). Reference Page  
[http://www.islandia.is/~midvangur/new\\_page\\_8.htm](http://www.islandia.is/~midvangur/new_page_8.htm)

Monique Guillou - Web Page URL

My main echinoderm model in ecology and ecotoxicology is *Sphaerechinus granularis*. Please find in this web page some informations to better know this sea urchin.  
<http://www.univ-brest.fr/IUEM/BIOFLUX/PNDR/echino.html>

In *Sphaerechinus granularis* resource allocation is "plastic" and varies in response to environmental changes. The following page presents changes in the reproductive strategy of this species according to food availability.  
<http://www.univ-brest.fr/IUEM/BIOFLUX/PNDR/allocener.html>

Jean-François Hamel - [www.seve.cjb.net](http://www.seve.cjb.net)

Reimund Haude - <http://www.gwdg.de/~uggpwww/>

Joan Herrera - <http://nersp.nerdc.ufl.edu/~herrera/>

Alan Hodgson - <http://www.rhodes.ac.za/conferences/icird2001>

9th International Congress on Invertebrate Reproduction and Development. July 2001  
first announcement and preliminary details

Susan Hottenrott - <http://home.att.net/~ophiuroid>

The Ophiuroidea is a informational (and even entertaining) site focusing on the brittle stars. It also has features on the museums around the world (that I have visited) with echinoderm collections, as well as information on funding your research (in the U.S.).

Thomas Kammer - <http://www.geo.wvu.edu/~kammer/welcome.htm>

Alexander Kerr - [http://peaplant.biology.yale.edu:8001/~jklab/alex\\_kerr.html](http://peaplant.biology.yale.edu:8001/~jklab/alex_kerr.html)

Lucas, J. - URL Aquaculture: <http://www.jcu.edu.au/dept/Aquaculture/aquacult.htm>

Christopher Mah - CAS Echinoderm Web Page  
[www.calacademy.org/research/izg/echinoderm/](http://www.calacademy.org/research/izg/echinoderm/)

Tamara McGovern - details research and study system  
<http://bio.fsu.edu/~mcgovern/>

Charles G. Messing - comatulid crinoid web pages  
<http://www.nova.edu/ocean/messing/crinoids/w1title.html>

Philip Mladenov - <http://gandalf.otago.ac.nz:800/Marine/marine.htm>

Andrew Morgan - <http://www.auckland.ac.nz/leigh>  
Leigh Marine Laboratory web page:

James Nebelsick - <http://homepages.uni-tuebingen.de/nebelsick/>  
Great animation of a "Clypeaster going down the taphonomic road to destruction"

Vaclav Petr - A complete and updated bibliography of Rudolph J. Prokop  
<http://www.natur.cuni.cz/~vpetr/Rudolph.htm>  
English home page - <http://www.natur.cuni.cz/~vpetr/Anglicky.htm>  
Petr bibliography - <http://www.natur.cuni.cz/~vpetr/Petr.htm>  
Anniversary article for F.H.C. Hotchkiss - <http://www.natur.cuni.cz/~vpetr/Birth.htm>

Dieter Piepenburg - <http://www.uni-kiel.de/ipoe>

Mike Reich - <http://www.uni-greifswald.de>

"The Fossil Holothuroidea Webpage" - <http://www.uni-greifswald.de/~geo/REICH/P224.htm>

Mike Reich, (University of Greifswald, Germany)

has prepared a bibliography of fossil holothurians (after 1990) -- please check:

<http://www.uni-greifswald.de/~geo/REICH/P310.htm>

[the complete bibliography of fossil holothurians (1828-1999) will be published next year].

Michael S. Roy - <http://www.otago.ac.nz/Zoology/staff/mr.html>

Mattias Skold - <http://www.otago.ac.nz/MarineScience>

Norman Sloan - <http://fas.sfu.ca/parkscan/gwaii>  
sea cucumber fisheries

Sponer, Renate - molecular evolution of ophiuroids: phylogeny, phylogeography, population genetics in *Amphipholis squamata*, *Ophiactis savignyi*, *Ophiocoma scolopendrina*.  
<http://www.dnapop.zi.ku.dk>

Sabine Stoehr - <http://www.nrm.se/ev/staff/stohr.html.en>

Jarek Stolarski - [www.paleo.pan.pl](http://www.paleo.pan.pl)

Institute of Paleobiology, Polish Academy of Sciences

Claudio Tiago and Valeria Hadel - <http://www.usp.br/cbm/>

Homepage Centro de Biologia Marinha at Universidade de São Paulo, Brasil

Research page - <http://www.usp.br/cbm/pesquisa.html>

BIOTA/FAPESP - The Virtual Institute of Biodiversity - <http://www.biotasp.org.br>

This is a biodiversity conservation and sustainable use research program for the State of São Paulo, Brazil, sponsored by FAPESP.

Tommasi, L.R. 1999. Echinodermata recentes e fósseis do Brasil. In: BDT - Informação científica - Diversidade de espécies - Fauna - Invertebrados. Campinas: Banco de Dados 110Tropical. [in Portuguese]. <http://www.bdt.org.br/zoologia/echinodermata/>

Curriculum involving echinoderms, especially the Brazilian REVIZEE material (NE and SE Brazilian regions); also, antarctic collections; palaeobiogeography and modern biogeography of echinoderms in the South Atlantic region.  
[www.geocities.com/CollegePark/center/2122](http://www.geocities.com/CollegePark/center/2122)

☆☆☆☆ RECENT ECHINODERMS PUBLICATIONS ☆☆☆☆

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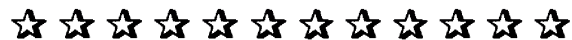
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**PLANT AND ANIMAL POPULATIONS. METHODS IN DEMOGRAPHY. Academic Press, San Diego, CA 312p**

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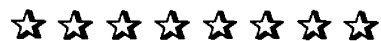
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**Levin V.S. 1999.**

**FEEDING BY SHALLOW WATER HOLOTHUROID (ECHINODERMATA) AND ITS EFFECT ON THE ENVIRONMENT.**

Saint-Petersburg, Politechnika. 1999. 254 p. [1-131 - English, 133-254 - Russian].



**MIGOTTO, A.E. & TIAGO, C.G. (eds.) 1999. Biodiversidade do Estado de São Paulo, Brasil: síntese do conhecimento ao final do século XX, Volume 3: Invertebrados marinhos. São Paulo: Fundação de Amparo à Pesquisa do Estado de São Paulo - FAPESP. 310p. [in Portuguese].**

Its chapters contain all published information and knowledge of each marine invertebrate's phyla on the Brazilian littoral. One has included, also, general information on those phyla that, until now, had not been registered for this area. Through the effort of some researchers those groups appear in the book. They tried to gather information on their general biology and ecology as well as the Brazilian literature concerning each one.

As for the Echinodermata, we listed all the literature related to the State of São Paulo, the main subject of the book, and almost all related to the rest of the Brazilian coast. From these references, however, it is possible to get the ones that had not been included.

The last chapter (44 - Synthesis), has a table with the summarized data about the collections and the research groups on each phyla.

Invertebrados Marinhos is the third of a set of four published volumes of the series "Biodiversity of São Paulo State, Brazil". They show the first results of the BIOTA/FAPESP - The Virtual Institute of Biodiversity (<http://www.biotasp.org.br>). This is a biodiversity conservation and sustainable use research program for the State of São Paulo, Brazil, sponsored by FAPESP (Fundação de Amparo à Pesquisa do Estado de São Paulo/State of São Paulo Research Council). They cover macroscopic fungi and plants (vol. 2), marine invertebrates (vol. 3), terrestrial invertebrates (vol. 5) and vertebrates (vol. 6). The other three: microorganisms and viruses (vol. 1), fresh water invertebrates (vol. 4) and in-situ and ex-situ conservation infrastructure (conservation areas, museums, herbariums and zoos; vol. 7).

The program's first phase evaluated the existing knowledge base of different taxonomic groups, from viruses to mammals and angiosperms. Documents were prepared containing information such as lists of species, researchers involved with specific groups, ex-situ and in-situ conservation infrastructure. Approximately 100 researchers were contacted and contributed with their knowledge to produce a series of such documents, published in the form of the 7 volumes (<http://www.biotasp.org.br/publi>).

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*Editado por*

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e

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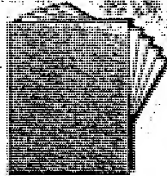
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***Catalogue des Invertébrés  
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du Saint-Laurent/  
Catalogue of the Marine  
Invertebrates of the Estuary  
and Gulf of Saint Lawrence***

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Gabriel Lamarche

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This catalogue presents a fairly complete inventory of 2214 species, subspecies and varieties, most of them named to the species level, of metazoan invertebrates recorded from the Gulf of St. Lawrence, the St. Lawrence Estuary (salinity 0.5 to 33‰) and the Saguenay Fjord. Benthic, planktonic, nektonic and parasitic species are covered, as are some salt-tolerant freshwater species. The data, sometimes new, are taken from (a) broadly disseminated literature (since 1841) or "grey" literature (e.g., theses, manuscript and unpublished reports), and from (b) three Quebec-based research collections containing as yet unpublished records. All faunistic records for each species have been accurately documented. For every species, codes are used to denote (1) the species'

geographic distribution in 20 fairly natural zones in the Gulf, (2) its occurrence (and its estimated preferences) in different depth zones, or in benthic, pelagic, parasitic, estuarine or freshwater habitats, and (3) at least one but usually several taxonomic references. The most recent, complete, well-illustrated and key-supplied references available have been provided, in order to facilitate identification and back up the synonymy.

Thanks to the information provided by 66 taxonomists, we have updated the nomenclature of each species and corrected, whenever possible, wrong or incorrectly spelled identifications from the past. In a voluminous alphabetical index, the nomenclature is cross-referenced to all the names of higher taxa, genera, species, and old synonyms and mis-identifications reported for the Estuary and the Gulf. A system of codes and four-degree doubts, along with numerous remarks on taxonomic and nomenclatural matters, has been used to accept or reject names from the list of valid Gulf species, in keeping with our goal of ensuring the critical nature of this catalogue. A numbered bibliography containing 1910 titles of references and other faunistic (e.g., collections) or taxonomic sources is provided to support the many citations.

The Introduction of the *Catalogue of the Marine Invertebrates of the Estuary and Gulf of Saint Lawrence* is available for viewing at the NRC Research Press Web site, at [http://www.nrc.ca/cisti/journals/41393/invert\\_e.html](http://www.nrc.ca/cisti/journals/41393/invert_e.html)



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### **Pierre Brunel**



Pierre Brunel, born in Montreal in 1931, obtained a B.Sc. in biology from the Université de Montréal in 1962. His study of amphipod Crustacea in Baie des Chaleurs, started in 1954, led to an M.A. from the University of Toronto, then to employment by the Station de

Biologie marine de Grande-Rivière (Gaspé) (Quebec Department of Fisheries). In 1966 he moved to teaching in the Department of Biological Sciences of the University of Montreal and obtained his Ph.D. in 1968 from McGill University. In 1970 he joined ex-colleagues from McGill University to establish the Groupe interuniversitaire de Recherches océanographiques du Québec (GIROQ), where he sat on the executive board until 1989. His research has dealt mostly with the ecology of marine bottom communities, mostly in the Gulf and Estuary of the St. Lawrence, but also in the Saguenay Fjord, the Bay of Fundy, and Hudson Bay, as well as amphipod taxonomy and cod feeding and migrations. Since 1990 he has redirected his activities more toward biodiversity and saving research collections, especially through the establishment with colleagues of the Québec Biodiversity Network.

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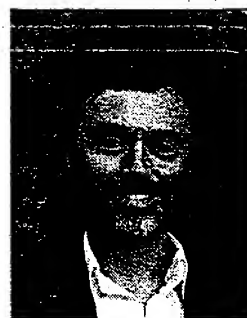
### **Luci Bossé**



Luci Bossé obtained a B.Sc. in biology in 1977. For nearly 15 years she developed and managed a collection of marine organisms at the Maurice Lamontagne Institute, Department of Fisheries and Oceans research center located in Mont-Joli, Québec. She provided an expertise in taxon-

omy and realized projects on marine fauna of the Saint Lawrence Gulf and Estuary. In April 1997 she joined the Protection of the Environment Group where she is encountering new challenges in the establishment and management of marine protected areas designated in the *Oceans Act*.

### **Gabriel Lamarche**



Gabriel Lamarche was born in Montreal in 1951. He obtained a B.Sc. in biological sciences in 1978 at the University of Montreal and an M.Sc. in marine biology from the same institution in 1983. He has worked as a freelance consultant biologist for universities, private companies,

for the Makivik Corporation, and for the Canadian Department of Fisheries and Oceans since 1978. In 1995 he obtained a B.Sc. in civil engineering, specializing in environmental problems, from the École Polytechnique de Montréal. He is now a freelance consultant in environmental issues.



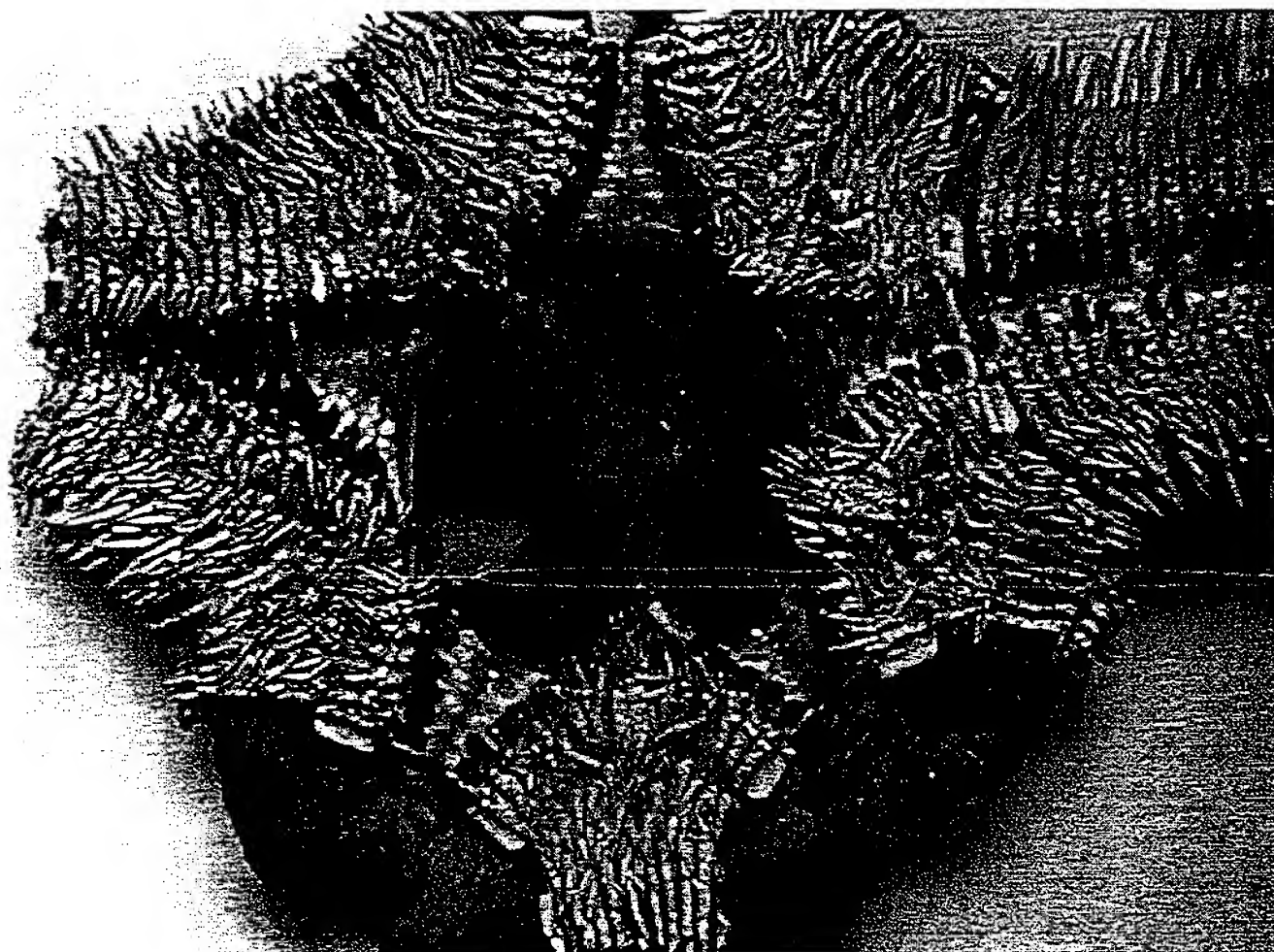
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Visit the Virtual Echinoderm Newsletter to view this remarkable 'Voracious Starfish'

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## A voracious starfish!!!!!!

Most echinoderm species in littoral or intertidal environments eat almost anything at their disposal. Some opportunistic genera of starfish such as *Solaster* and *Luidia* show extreme carnivorous habits feeding mainly on other echinoderms! - even of the same genera! This last attribute and the great capacity of contraction and expansion of their connective tissues make them one of the most voracious group of marine invertebrates!

The Mexican Echinoderm National Collection (Colección Nacional de Equinodermos) "Maria Elena Caso Muñoz" from the Instituto de Ciencias del Mar y Limnología, at the Universidad Nacional Autónoma de México (UNAM), held 39 specimens of *Luidia superba* (Clark) collected in different localities (Sinaloa, Colima, Michoacán, Oaxaca, and Guerrero) including those donated by the Allan Hancock Collection (actually County Museum of Los Angeles County, U.S.A.), San Diego San Diego Society of Natural History (actual catalogue number: ICML-UNAM 2.29.3), collected at the Mexican Pacific (Bahía de Los Angeles, Baja California North, Mexico) by the "Museum Party" at the littoral frame (muddy substrate) (collecting date missing). This particular specimen attracts our attention because of the presence of a big sand dollar (*Encope grandis* L Agassiz [length = 102 mm; wide = 101 mm]) inside its stomach!. The measurements of the starfish are (R = 267 mm, and r = 217 mm). Two starfish were collected, each one with a sand dollar inside it.

To know more about feeding behaviour and connective tissues in asteroids see:

Birenheide, R., S. Amemiya, T. Motokawa. 1993. Penetration and storage of sponge spicules in tissues and coelom of spongivorous echinoids. *Mar. Biol.* 115:677-683.

Blake, D.B. 1990. Adaptive Zones of the Class Asteroidea (Echinodermata). *Bulletin of Marine Science*, 46(3): 701-718.

Dearborn, J. H. 1977. Foods and feeding characteristics of Antarctic Asteroids and Ophiuroids. *The Proceedings of the Third SCAR Symposium on Antarctic Biology. Adaptations within Antarctic Ecosystems. Smithsonian Institution.*: 293-326.

Dearborn, J. H., K. C. Edwards and D. B. Fratt. 1982. Feeding biology of sea stars and brittle stars along the Antarctic Peninsula. *Antarctic Journal of the United States* (1981 review) 16(5): 136-137.

Jangoux, M. 1982. Food and feeding mechanisms: Asteroidea. *In: Echinoderm Nutrition*, (M. Jangoux & J. M. Lawrence, eds.), A. A. Balkema, Rotterdam. 15: 654 pp.

Lima-Verde, J. S., and H. Ramos-Matthews. 1969. On the feeding habits of the sea star *Luidia senegalensis* (Lamarck) in the State of Ceará (Brazil). *Aeq. Ciên. Mar.* 9(2): 173-175.

McClintock, J. B. and J. M. Lawrence. 1981. An optimization study on the feeding behavior of *Luidia clathrata* Say (Echinodermata: Asteroidea). *Mar. Behav. Physiol.* 7: 263-275.

Sloan, N. A. 1980. Aspects of the feeding biology of asteroids. *Oceanogr. Mar. Biol. Ann. Rev.* 18: 57-124.

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## Una estrella de mar muy voraz !!!!!

La mayoría de las especies de equinodermos, dentro de la fauna litoral o intermareal, comen todo lo que tengan disponible, otras en cambio, además de ser oportunistas, pueden también seleccionar su alimento, tal es el caso de algunos géneros de estrellas de mar como *Solaster* y *Luidia* que muestran hábitos carnívoros extremos, alimentándose principalmente de otros equinodermos (inclusive de los mismos géneros), estos últimos atributos, y la gran capacidad de contracción y expansión de sus tejidos conectivos, hacen a este grupo uno de los invertebrados marinos más voraces!

La Colección Nacional de Equinodermos "María Elena Caso Muñoz" del Instituto de Ciencias del Mar y Limnología, Universidad Nacional Autónoma de México (UNAM), alberga 37 ejemplares de *Luidia superba* (Clark) colectados en distintas localidades del Pacífico Mexicano (Sinaloa, Colima, Michoacán, Oaxaca, y Guerrero); incluyendo algunas donaciones de la Allan Hancock Collection (actualmente el County Museum of Los Angeles County, E.U.A.), San Diego Society of Natural History (número de catálogo actual: ICML-UNAM 2.29.3), colectado en el Pacífico Mexicano (Bahía de Los Angeles, Baja California al Norte de México) por el "Museum Party", en la franja litoral (substrato fangoso) (fecha de colecta no disponible). Este espécimen en particular, llama nuestra atención por la presencia de una gran galleta de mar (*Encope grandis* L. Agassiz [largo = 102 mm; ancho = 101 mm]) dentro de su estómago!. Las medidas de la estrella de mar son ( $R = 267$  mm, and  $r = 217$  mm). Originalmente fueron colectados un par de estos organismos, cada uno con una galleta de mar dentro.

Para saber más sobre el comportamiento alimenticio y tejidos conectivos de las estrellas de mar:

Birenheide, R., S. Amemiya, T. Motokawa. 1993. Penetration and storage of sponge spicules in tissues and coelom of spongivorous echinoids. *Mar. Biol.* 115:677-683.

Blake, D.B. 1990. Adaptive Zones of the Class Asteroidea (Echinodermata). *Bulletin of Marine Science*, 46(3): 701-718.

Dearborn, J. H. 1977. Foods and feeding characteristics of Antarctic Asteroids and Ophiuroids. *The Proceedings of the Third SCAR Symposium on Antarctic Biology. Adaptations within Antarctic Ecosystems.* Smithsonian Institution.: 293-326.

Dearborn, J. H., K. C. Edwards and D. B. Fratt. 1982. Feeding biology of sea stars and brittle stars along the Antarctic Peninsula. *Antarctic Journal of the United States* (1981 review) 16(5): 136-137.

Jangoux, M. 1982. Food and feeding mechanisms: Asteroidea. *In: Echinoderm Nutrition*, (M. Jangoux & J. M. Lawrence, eds.), A. A. Balkema, Rotterdam. 15: 654 pp.

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McClintock, J. B. and J. M. Lawrence. 1981. An Optimization study on the feeding behavior of *Luidia clathrata* Say (Echinodermata: Asteroidea). *Mar. Behav. Physiol.* 7: 263-275.

Sloan, N. A. 1980. Aspects of the feeding biology of asteroids. *Oceanogr. Mar. Biol. Ann. Rev.* 18: 57-124.

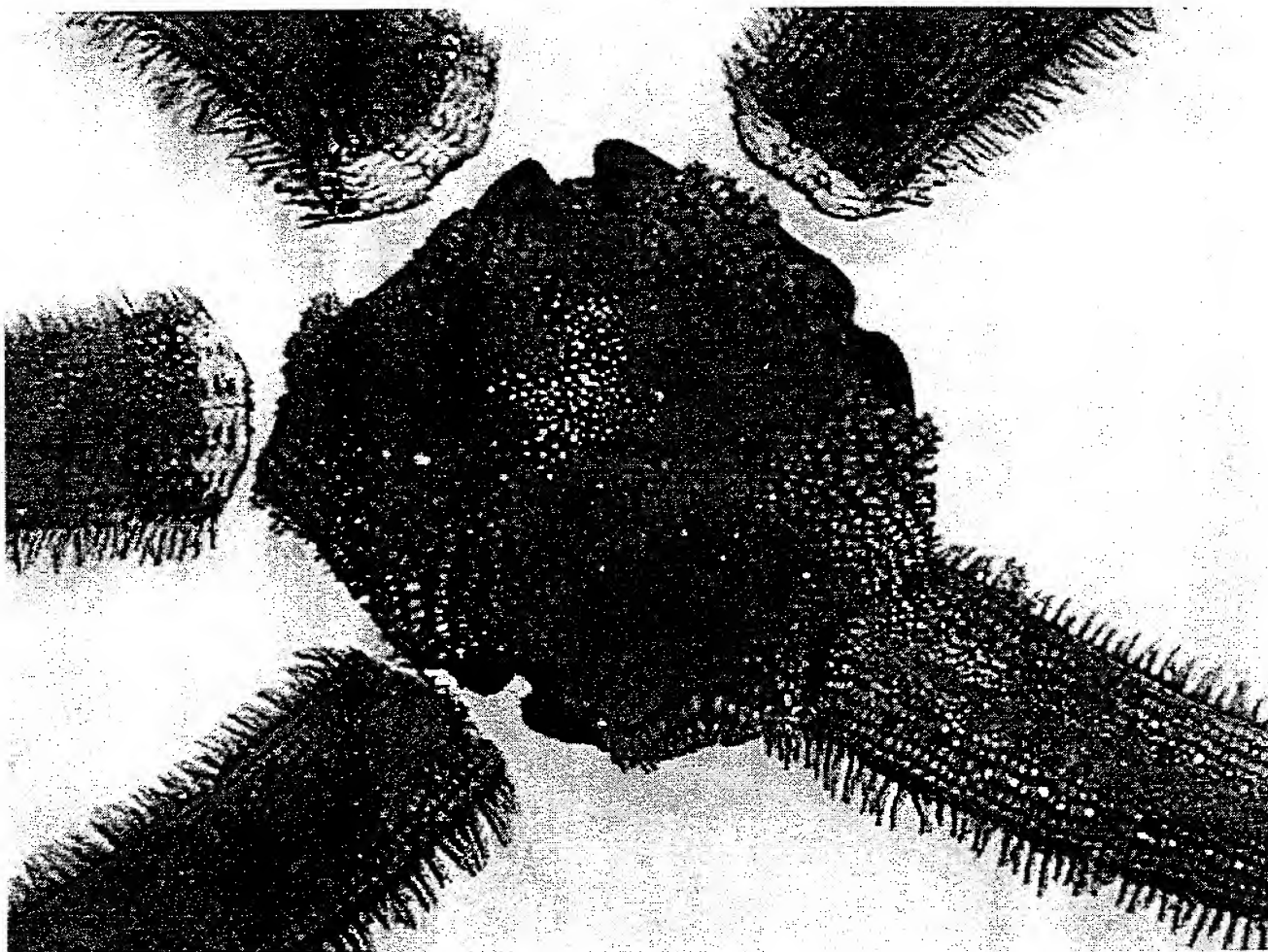
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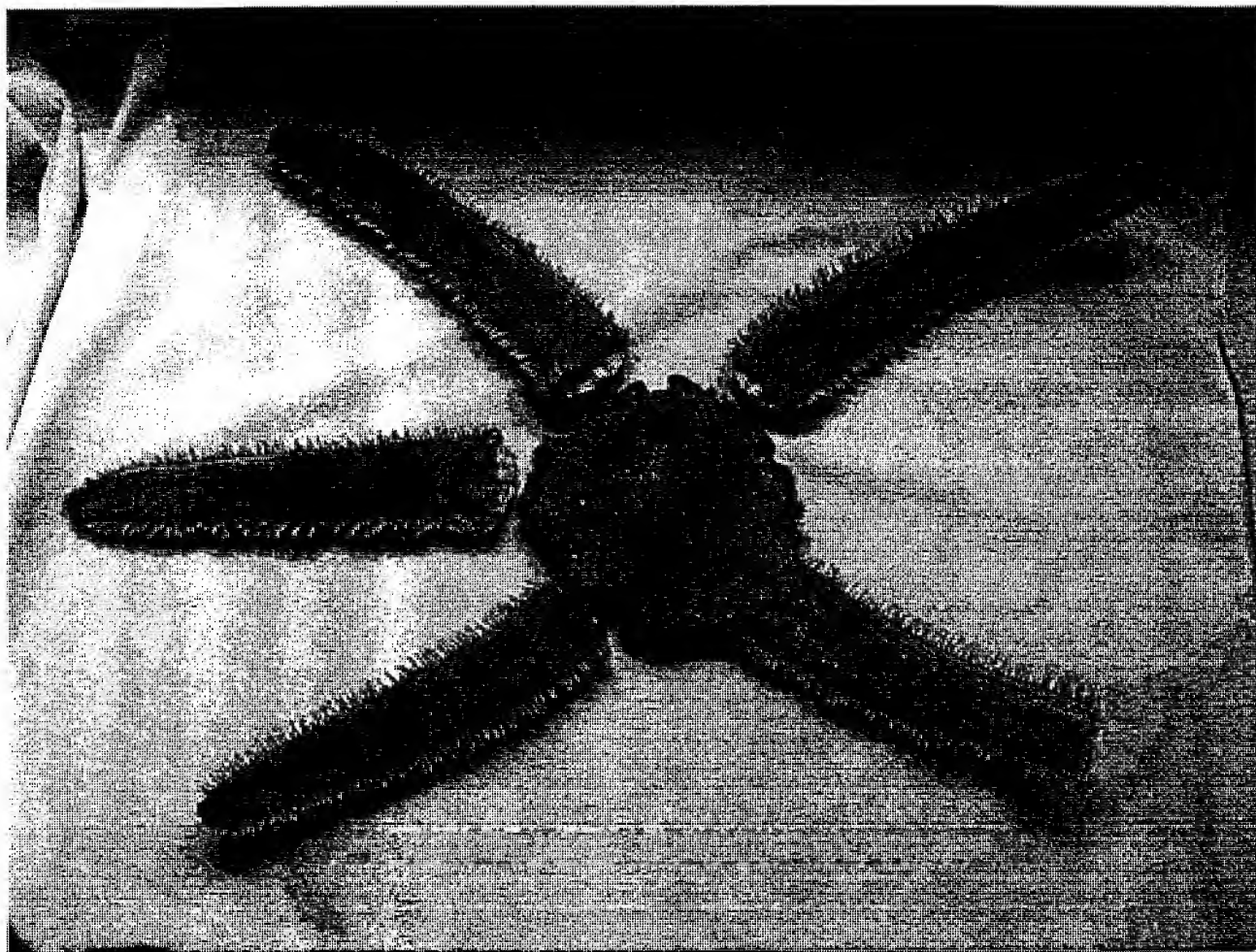
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☆☆☆ Voracious starfish, cont'd ☆☆☆

The editor received the image files of the *Luidia superba* eating *Encope grandis* from ICML-UNAM, Mexico City during Dr. Richard Mooi's Sept-Oct 1999 visit to the National Museum of Natural History, Smithsonian Institution.

Rich adds the following remarks:

First, I think I can assure you that this is not a hoax or a doctored specimen of some kind. Only a living asteroid could get a sand dollar of that size into the body cavity without destroying the integrity of the body wall. Second, the orientation of the *Encope* inside the mouth suggests that the *Luidia* ingested it by moving over the *Encope* as it lay on the bottom in its natural orientation--with the oral surface down. Third, it would appear that mutable collagenous tissues (MCT) would have to come into play to make it possible for the mouth angle plates and proximal parts of the ambulacra to move apart enough to permit passage of the sand dollar into the stomach. MCT is not unknown in asteroids, but I am not sure if it has been recorded in the regions between ambulacral plates before. It would not be a surprise to find it there, though, given that it seems to be present between ambulacral ossicles of ophiuroids.

The use of MCT to stretch and soften body regions could also be responsible for weakening the body wall of the disk of the *Luidia* to the point where the arms could easily be broken off during post-mortem handling. I doubt very much that the arms broke off during the process of swallowing the sand dollar.

Other species of *Luidia* are known to swallow sand dollars whole. For example, *Luidia clathrata* can swallow entire specimens of irregular urchins, including the sand dollar *Mellita*, and the spatangoid *Moiria atropos* (Hendler et al., 1995, "Sea stars, Sea urchins, and Allies", p.69.).

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Recommended reading:

Motokawa, T. 1998. 'Exoskeleton-like endoskeleton' + 'mechanically active connective tissue' = success of echinoderms: An anthem of Echinodermata. Pp. 63-64 in *Echinoderms*: San Francisco, Mooi & Telford (eds), Balkema, Rotterdam.

Motokawa, T. 1985. Catch connective tissue: the connective tissue with adjustable mechanical properties. Pp. 69-73 in *Echinodermata*, B.F. Keegan & B.D.S. O'Connor (eds), Balkema, Rotterdam.

☆☆☆☆☆☆☆☆

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☆☆☆ ECHINODERM SPECIALISTS 'KEYWORD' LIST ☆☆☆

Abreu, Maria Helena	Echinoidea
Freeman, Steven	Biodiversity Ecology
Giuliano, Laura	Symbiotic-or-pathogenic-bacteria-colonizing-sea-urchins
Matias, Miguel	Echinoidea
Payne, Adam	Ophiuroidea Ecology Predation
Santos, Joco Faria	Echinoidea

☆☆☆ RECENT PUBLICATIONS ☆☆☆

Mah, Christopher L. 1999. Taxonomy of the South Pacific brisingidan *Brisingaster robillardii* (Asteroidea) with new ontogenetic and phylogenetic information. *Zoosystema*, 21(3):535-546.

Neumann, C. 1999. New spatangoid echinoids (Echinodermata) from the Upper Cretaceous of Jordan: their taxonomy and phylogenetic importance. *Berliner Geowiss. Abh.*, 30: 175-189.

☆☆☆ ECHINODERMS IN LITERATURE ☆☆☆

**Contributed by John M. Lawrence:**

Pliny. Natural History. Translation by John Bostock and H.T. Riley. London, Henry G. Bohn.

Book XXXII, Chapter 20. "As a counter-poison to doryenium, sea-urchins are remarkably useful; as also in cases where persons have taken juice of carpathum internally; more particularly if the urchins are used with the liquor in which they are boiled".

Book XXXII, Chapter 16. "It is asserted also, that if the fish called the sea-star is smeared with a fox's blood, and then nailed to the upper lintel of the door, or to the door itself, with a copper nail, no noxious spells will be able to obtain admittance, or, at all events, to be productive of any ill effects."



### ☆☆☆ CURRENT RESEARCH ☆☆☆

Giuliano, L. - studying sea urchin interspecific relationships. Particularly, I am interested in symbiotic and/or pathogenic bacteria colonizing the sea urchin (with special emphasis on *Paracentrotus lividus*, means species in the Mediterranean Sea), and any other kind of direct-indirect relations between bacteria and sea urchins (food during larval period, etc.).

Freeman, S. M. - Relationships between macro-epibenthic faunas and the seabed. Mapping benthic distributions using acoustic ground discrimination systems and GIS. Patterns in the geographical distribution of Echinoderms and their association with habitat complexity.

Mata Perez, E. - Sea Stars of the Family Luidiidae (Echinodermata: Asteroidea) from the Coast of Mexico.

Payne, Adam - studying the association between damselfish and brittlestars in Jamaica. I am especially interested in predatory and carrion feeding brittlestars and associations between the ophiuroids and other animals of different taxa and phyla.

### ☆☆☆ DISSERTATIONS ☆☆☆

#### **Ph.D. Dissertation**

Freeman, Steven M. 1999. The ecology of *Astropecten irregularis* and its role as a benthic predator in a soft-sediment community. University of Wales Bangor, North Wales, UK.

Topics - feeding ecology (both experimental and field based), locomotory activity, prey capture, prey selection, ecology of its commensal polychaete *Acholoe squamosa*.

#### **Master's Thesis**

Mata Pérez, Eustolia. Taxonomy and distribution of the Family Luidiidae Sladen, 1889 (Echinodermata: Asteroidea) in the Mexico's coast. Universidad Nacional Autónoma de México (UNAM).

☆☆☆ PAPERS PRESENTED AT CONFERENCES ☆☆☆

Freeman, S. M., C.A. Richardson, and R. Seed. 1999. Seasonal abundance prey selection and locomotory activity patterns of *Astropecten irregularis*. **Proceedings of the 5th European Conference on Echinoderms, Milan, 7-12 Sep 1998 (M. D. Candia Carnevali, and F. Bonasoro, eds) A.A. Balkema, Rotterdam, pp. 459-464.**

Mata Pérez, E. Distribution of the Family Luidiidae Sladen, 1889 (Echinodermata: Asteroidea) in the Gulf of California. **X International Symposium of Marine Biology. June 13-17, 1994.**

Mata Pérez, E. The problematics of the concept of specie in echinoderms. **Second journey of Biology. July 10-14, 1995.**

Mata Pérez, E. Distribution of the Family Luidiidae Sladen, 1889 (Echinodermata: Asteroidea) in the Coast of Mexico. **XIII National Congress of Zoology. November 21-24, 1995.**

Mata Pérez, E. Systematics of the Sea Cucumbers (Echinodermata: Holothuroidea) of the Coast of Mexico. **XIII National Congress of Zoology. November 21-24, 1995.**

Mata Pérez, E. The Sea Stars of México. **IV Meeting of Researchers in the Flora and Fauna of the Region Middle-South. October 26-27, 1995.**

Mata Pérez, E. Systematics of the Sea Urchins (Echinodermata: Echinoidea) in the Oceanographic Campaign PROIBE: I-V of the Mexican Caribbean during the years 1983-1986. **XI International Symposium of Marine Biology. November 18-22, 1996.**

Mata Pérez, E. Present knowledge of the Taxonomy from the Echinoderms of Mexico. **Week of the Biology of the XXIV Anniversary of the Biology Faculty. November 3-7, 1997.**

Mata Pérez, E. Faunistic Diversity of Mexico. **Symposium "Echinoderms" in the XIV National Congress of the Zoology. November 4-7, 1997.**

Mata Pérez, E. Principal factors bio-abiotics that affect the distribution of the Family Luidiidae (Echinodermata: Asteroidea) off the coast of Mexico. **XIV National Congress of the Zoology. November 4-7, 1997.**

Mata Pérez, E. Present state of the Taxonomy of the Sea Stars in México. **Symposium "Perspectives of studies about echinoderms in Mexico" in the XIV National Congress of Zoology. November 4-7, 1999.**

